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AUTHOR Green, Kenneth C.; Eastman, Skip
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ABSTRACT

The National Survey of Desktop Computer Use in Higher Education was conducted in the spring and summer of 1990 by the Center for Scholarly Technology at the University of Southern California, in cooperation with EDUCOM and with support from 15 corporate sponsors. The survey was designed to collect information about campus planning, policies, and procedures affecting the use of desktop computers (i.e., personal computers and workstations) from colleges and universities in the United States including Alaska and Hawaii. Information elicited included general campus policies about desktop computing; current microcomputer and desktop computer facilities; hardware acquisition policies and procedures; software utilization issues; academic and instructional computing policies and procedures; future issues affecting campus computing; strategic planning issues; libraries and computers; networking; computing for disabled students; vendor assessment; and organization of campus computing and technology units. Questionnaires were mailed to some 2,500 campuses in May 1990; responses were received from 1,148 campuses (45.8%) by the closing date for data analysis. Data presented in this report are based on the responses from public and private research universities, public and private four-year colleges, and community colleges. (Survey results for private two-year campuses are not included because of the very small number of responses.) Survey respondents were individuals responsible for the operation and future direction of academic computing on their campuses. The report provides a narrative summary of the survey results, including the ratio of students to computers overall (46 students per machine) and also the ratios in the different types of schools; technology as an instructional resource; computing policies in the curriculum; resale activities; codes of conduct; hardware and operating systems; networking; and maintaining the infrastructure. Survey data are then presented in tabular format. Three appendices provide a description of the survey methodology; a copy of the 56-item survey instrument; and a list of participating institutions. (DB)

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CAMPUS COMPUTING 1990

The EDUCOM•USC Survey of Desktop Computing in Higher Education

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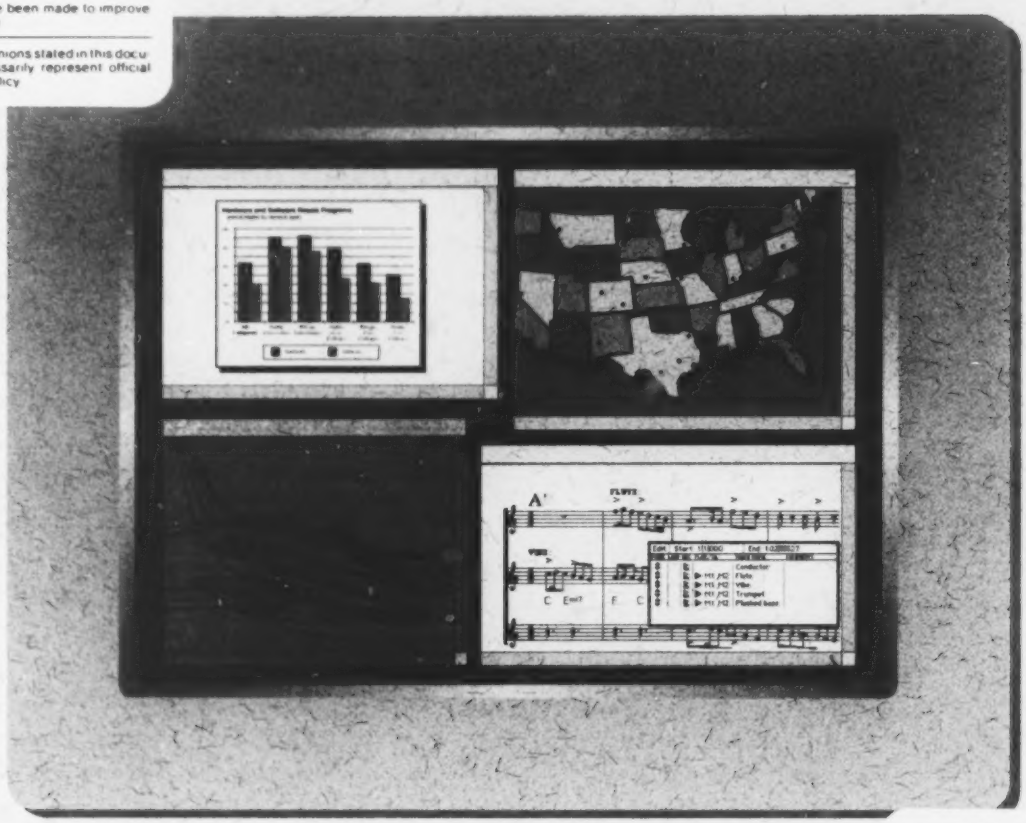

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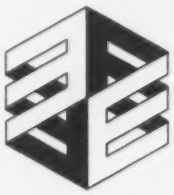
The Center for Scholarly Technology emphasizes research and development projects that address technology and information resources affecting higher education. A key component of the Center's mission is research about the organizational impacts of campus efforts to acquire and use technology as a resource for teaching, learning, and instruction. The Center also develops instructional software for USC faculty and information access tools for the USC Library System.



EDUCOM

EDUCOM, cosponsor of the 1990 Desktop Computing Survey, is a nonprofit consortium of over 600 colleges and universities and more than 130 corporate affiliates. The consortium seeks to facilitate the introduction, use, access to and management of information resources in higher education.

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CAMPUS COMPUTING 1990

The EDUCOM•USC Survey of Desktop Computing in Higher Education

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CAMPUS COMPUTING 1990

The EDUCOM•USC Survey of Desktop Computing in Higher Education

The National Survey of Desktop Computing in Higher Education was conducted in Spring and Summer 1990 by the Center for Scholarly Technology at the University of Southern California, in cooperation with EDUCOM and with support from 15 corporate sponsors.[1] The data presented in this report are based on the responses of some 1200 institutions across the the United States. The large number of institutional responses makes the 1990 EDUCOM•USC survey the largest national survey of desktop computing (i.e., personal computers and workstations) of its kind.

The data reported here represent responses from public and private research universities, public and private four-year colleges, and community colleges (i.e., public two-year colleges).[2] The survey respondents were individuals specifically responsible for the operation and future direction of academic computing on their campuses. Surveys were mailed to the senior academic computing officer; where it was not possible to identify someone with this title, the survey was sent to the senior academic officer of the institution. (Additional information about the survey methodology is provided in Appendix A.)

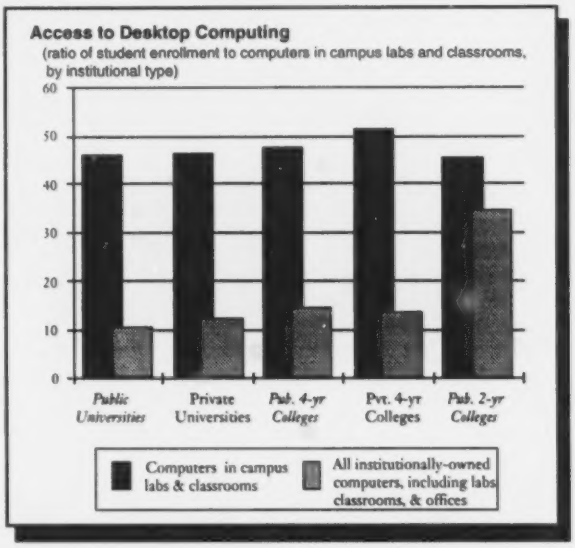

Figure 1

Access to Computing Resources

Despite significant differences in institutional mission, academic programs, financial resources, and undergraduate clientele, the nation's colleges and universities provide surprisingly similar levels of institutional or public access to desktop computing for their students through campus labs and computer-equipped classrooms. The 1990 EDUCOM•USC Survey data indicate that the ratio of students to desktop computers and workstations in campus labs and classrooms is a fairly consistent at about 46 students per machine across community colleges, four-year public and private institutions, and public and private universities (see Figure 1).[3]

In contrast to the small variations in access to computers in classrooms and computer clusters, the survey shows large differences in the overall ratio of institutionally-owned desktop computers per student. The overall institutional ratio of students per computer (including all desktop computers and workstations in campus labs *and* faculty offices) ranged from an average of 34 students per system in community colleges to 10 students per computer in public research universities (Figure 1).

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[1] The 1990 EDUCOM•USC National Survey of Desktop Computing was supported, in part, by grants from the following corporate sponsors: AutoDesk, Apple Computer, Commodore Computer, Dell Computer, Digital Equipment Corp., Hewlett Packard, IBM, John Wiley & Sons Publishers, Lotus Development Corp., Microsoft Corp., NeXT, Software Publishers Association, SPSS, Sun Microsystems, and Zenith Data Systems.

[2] Private two-year colleges were included in the survey mailing. However, only a very small number of these institutions responded to the survey. The small number of responding institutions could not in any way be viewed as being representative of the population of some 250 private two-year colleges in the United States. Consequently, the data for private two-year colleges are not reported.

[3] The student/computer ratios reported here and elsewhere in this report are based on student headcount, not full-time equivalency (FTE) measures. Although FTE is commonly used for budget purposes, headcount is a more appropriate measure for assessing real student demand and access.

A key difference in computing behavior across campuses is the way some institutions provide computers to faculty as a matter of institutional policy and practice. Indeed, the survey data indicate that research-oriented institutions and more affluent campuses invest a greater proportion of their desktop computing resources in their faculty. For example, the proportion of all institutionally-owned desktop computers and workstations that are available to students in classrooms and computer clusters ranges from about 25 percent in public research universities to almost 90 percent in community colleges (Figure 2).

The 1990 survey provides ample evidence that students at elite and/or research-oriented institutions are more likely to own their own computers and that personal ownership helps offset demand for computing access and services that might otherwise be an institutional responsibility. In 1990, the estimated student ownership of personal computers ran from an average low of 14 percent in the nation's community

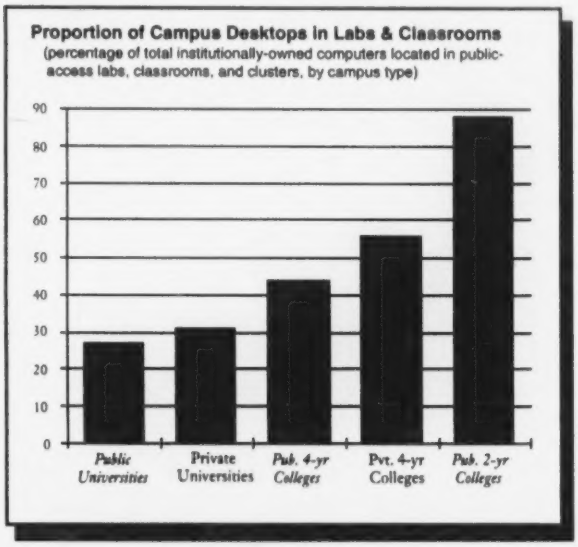

Figure 2

colleges to an average high of 29 percent in private (research) universities (Figure 3).

These data suggest that campuses with strong resale programs (see below) and high levels of individual student ownership are building computing capacity in part with student purchases. In essence, every student who purchases his or her own computer is generally one less student who must be served by campus computer resources.

The survey data also reveal that faculty, as a group, have the highest levels of computer ownership (i.e., they either personally own or have direct access to a desktop computer of workstation). Indeed, the survey data indicate that faculty (and to a slightly lesser degree, campus administrators) are about twice as likely as students to own computers. Ownership among students, faculty and administrators is highest in private universities and lowest in community colleges. And in community colleges, unlike in other segments, administrators are, on average, slightly more likely to have a desktop computer than faculty.

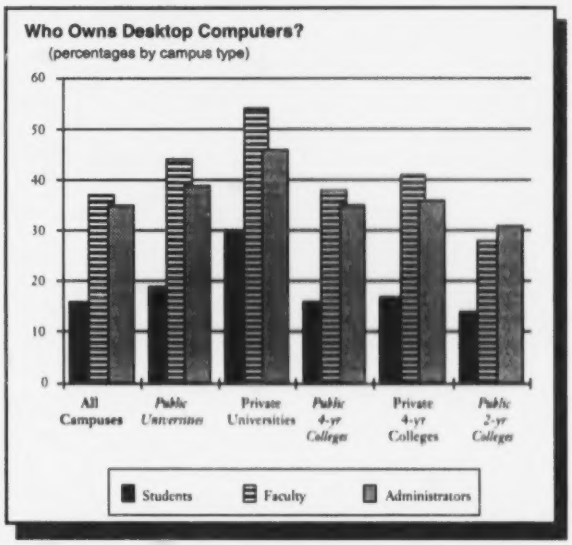

Figure 3

Technology as an Instructional Resource

Although many campuses want to use computer-based instructional technologies such as courseware and simulations, relatively few institutions offer any rewards or incentives to faculty to develop instructional resources.

Nationwide, three-fifths (61 percent) of the responding campuses indicate that "using instructional software in classes" will be a very important component of overall campus computing plans and policies in the next two-three years, while two-thirds (68 percent) report that "using instructional software as a supplement to classes" will be very important.

However, just two-fifths (40 percent) of the campuses nationwide "provide formal support or assistance" to help faculty who wish to develop instructional software, and only about one-eighth (13 percent) of the nation's campuses actually reward development efforts or provide incentives for faculty to develop courseware.

Computing Policies in the Curriculum

Despite the dramatic investment of institutional and student resources in computing over the past decade,

the 1990 survey reveals that less than one-third (31 percent) of the nation's campuses report that they have a formal policy promoting or mandating computers/computing resources for curriculum utilization (Figure 4). Similarly, only 28 percent of the campuses report that they have a "formal plan for integrating desktop computers" into the curriculum.

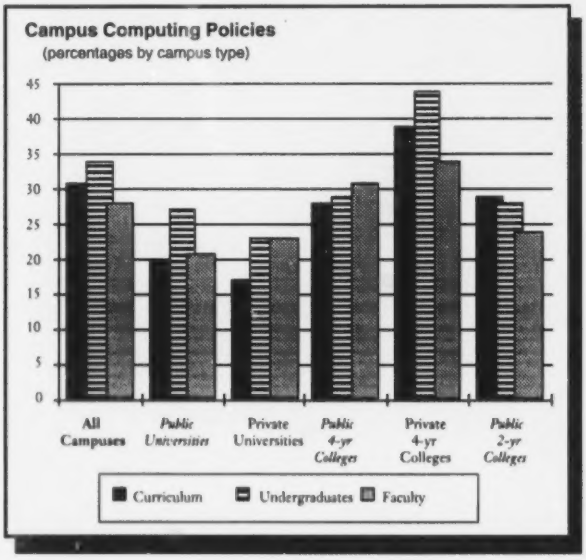

Figure 4

The survey data suggest that curriculum policies and implementation plans seem to be more common at institutions that have less computer capacity: 29 percent of the nation's community colleges and 38 percent of the nation's private four-year institutions have a formal institutional policy mandating or promoting computing in the curriculum, compared to just one-fifth (20 percent) of the nation's public universities and 17 percent of the nation's private universities. Similarly, 32 percent of the community colleges and 30 percent of the private four-year colleges have "a formal plan for implementing desktop computers into the curriculum," compared to 16 percent of public universities and 21 percent of private universities.

Institutions such as research universities that have significant computing resources may feel it less important to go "on record" about computing goals in the curriculum. At these comparatively "technology-rich" institutions, computing is part of (and indeed, may pervade) the general educational environment; most students will be exposed to computing as part of their undergraduate experience, almost regardless of their major. In contrast, those campuses such as community colleges and less-affluent four-year institutions, which traditionally have not had significant on-campus computing resources, may feel that formal institutional policies and plans help to promote both an internal and external awareness of the institution's computer resources and the potential role of computing in the curriculum.

Resale Activities

As noted above, resale agreements play an important role in campus access to computers and software. About two-thirds (63 percent) of the responding institutions report that they have resale agreements with computer manufacturers, ranging from a low of 39 percent in community colleges to a high of 91 percent in private universities (Figure 5). However, a smaller proportion of colleges and universities report resale agreements with software companies. Nationwide, only 40 percent of the responding campuses report that they have resale agreements to sell software to students and faculty through campus bookstores, other on-campus sites, or through designated off-campus dealers. Software resale agreements range from a low of 25 percent in community colleges to a high of 79 percent in public universities.

Campuses that have hardware resale agreements handle resale activity in various ways. Two-fifths (41 percent) of the campuses that have hardware resale agreements base these programs in on-campus computer resale centers not affiliated with the campus bookstore. On many campuses these on-campus distribution centers are affiliated with the campus computing center. The campus bookstore accounts for

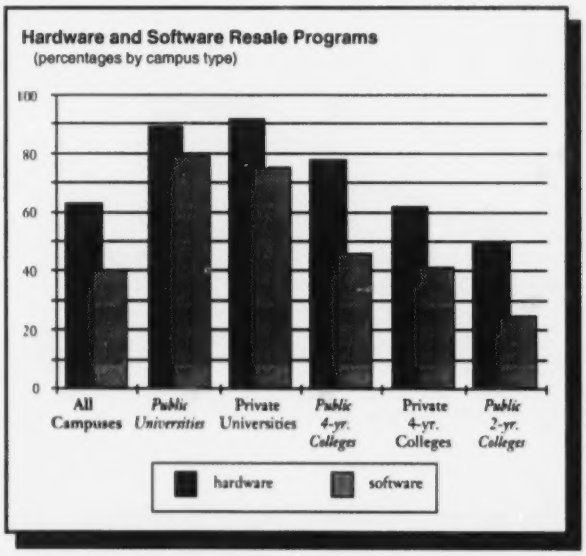

Figure 5

another one-third (32 percent) of the campus resale sites. And one-fourth (27 percent) of the campuses with resale programs report that computers are "sold by special agreement with an off-campus dealer," often with the involvement and support of one (or more) computer vendors. Yet the aggregated data mask important differences in resale channels across different types of campuses. For example, two-thirds (68 percent) of the private universities that offer resale programs do so through campus centers, while campus bookstores handle almost half (45 percent) of the resale activity for private four-year colleges.

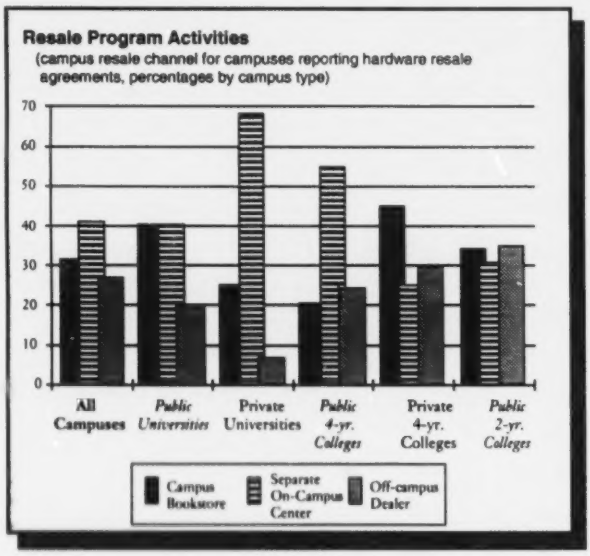

Figure 6

Codes of Conduct

Related to the issue of software resale programs, half the nation's colleges (50 percent) report that they either have or are currently developing a formal institutional policy regarding unauthorized software duplication: roughly a third (30 percent) report that these policies currently exist, and another fifth (20 percent) report that a policy is now under development (Figure 7).

A third (30 percent) also report that they have endorsed the EDUCOM Code, a statement of principle about intellectual property and the ethical and legal use of software developed by the EDUCOM Software Initiative for the higher education community.

However, even without formal policies, many campuses are addressing the piracy issue: for example, 67 percent of the responding campuses report some type of general promotional effort for user education and 52 percent address piracy and duplication issues in

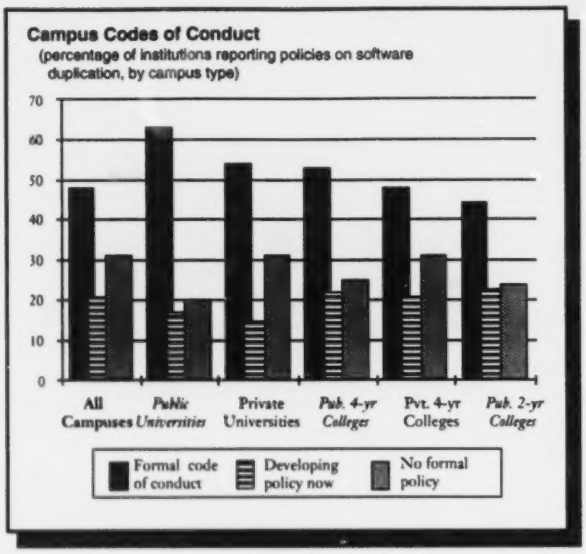

Figure 7

training classes. Yet comparatively few campuses include statements about piracy and illegal duplication in student handbooks (27 percent), faculty handbooks (26 percent), new student orientation (19 percent), faculty orientation programs (28 percent), and staff handbooks and orientation programs (20 and 17 percent, respectively).

Taken together, the survey data about resale programs and campus codes on software duplication suggest that colleges and universities should be more assertive about promoting copyright and intellectual property issues. One way campuses might quickly address the piracy issue would be to expand the scope of current student honor codes so that unauthorized software duplication is viewed similarly to plagiarism

The EDUCOM Code
A Statement of Principle about Intellectual Property

Respect for intellectual labor and creativity is vital to academic discourse and enterprise. This principle applies to all works of all authors and publishers in all media. It encompasses the right to acknowledgement, right to privacy, and right to determine the form, manner, and terms of publication.

Because electronic information is volatile and easily reproduced, respect for the work of others is especially critical in computer environments. Violations of authorial integrity, including plagiarism, invasion of privacy, unauthorized access, and trade secret and copyright violations may be grounds for sanctions against members of the academic community.

and cheating. Similar options exist for staff and faculty codes of conduct.

Hardware and Operating Systems

Like the corporate community, the campus community is quite concerned about trends in operating systems affecting desktop computers. As in the corporate community, MS-DOS® is still the preeminent operating system on college campuses: PC/MS-DOS earns a mean score of 5.3 (scale: 1=not important; 7=very important) in campus computing plans for the next two-three years (Figure 8). Following MS-DOS were Macintosh® and Unix®. However, the survey data show important institutional differences. Macintosh® and Unix® ranked at equal levels with PC/MS-DOS in private universities, although DOS was by far the most significant operating system for community colleges.

Like the corporate sector, the campus community has been slow to accept the future direction of Intel CPU-based and MS-DOS -based operating systems promoted by IBM (Figure 9). For example, few respondents to the 1990 survey identified IBM's OS/2® and Presentation Manager® as being very important to their institution's future computing plans over the next two-three years. (Only 12 percent report that OS/2 will be very important: just 7 percent identify Presentation Manager as very important.) Additionally, few institutions (15 percent) view IBM's MicroChannel Architecture® (MCA) hardware technology in the PS/2® series of desktop computers as very important in their future campus plans and purchases.

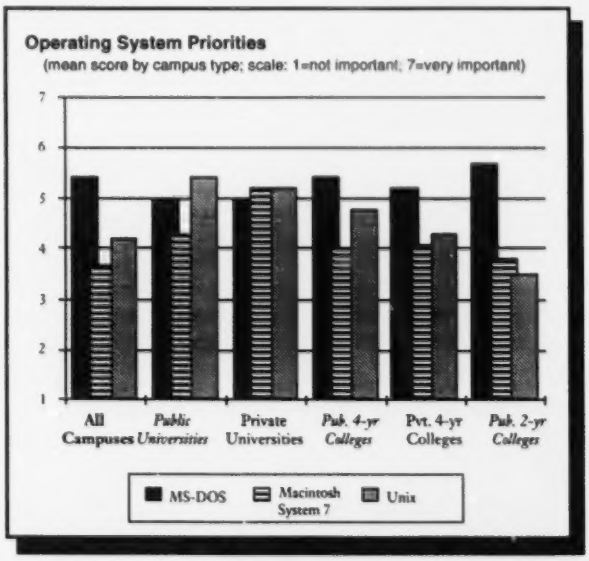

Figure 8

Yet the data also reveal little interest in the competing EISA® technology offered by IBM's competitors (e.g., Compaq, Hewlett-Packard, and Zenith). Less than one-tenth (9 percent) of the survey respondents view the competing EISA bus standards promoted by "clone" manufacturers as very important. Taken together, these data suggest that while campuses are

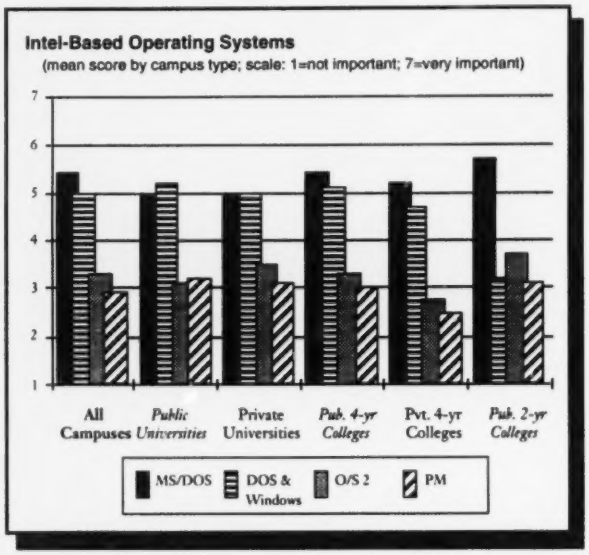

Figure 9

heavily committed to Intel CPU-based computers, they view the future in terms of processor power, rather than operating systems or proprietary architecture: indeed, over half the respondents report that '386 and '386SX systems will play a very important role in their campus computing plans and environment over the next two-three years.

Networking

Respondents indicate that "expanding campus networks" will be a top priority for their institutions in the next two-three years (Figure 10). Three-fourths (76 percent) of the respondents report that "expanding computer networking across the campus" is a very important campus priority. Not surprisingly, networking is even more important to research institutions (92 percent for public universities and 96 percent for private universities).

Yet the future priority for different types of networking activities varies by type of institution (Figure 11). For example, universities (both public and private) place greater priority on access to national networks and linking desktop computers to mainframe and minicomputer systems than do four-year institu-

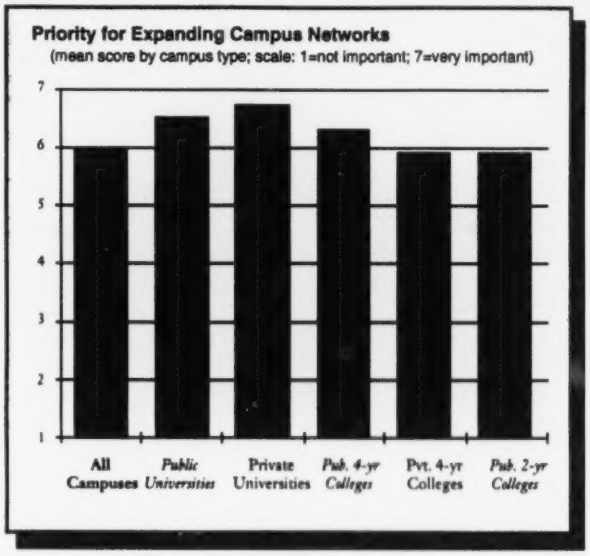

Figure 10

tions and community colleges. However, all types of institutions appear to place similar levels of priority on using networking as a way to share software (about 60-66 percent identify this as very important across campus types) and to support instructional labs about (70-75 percent).

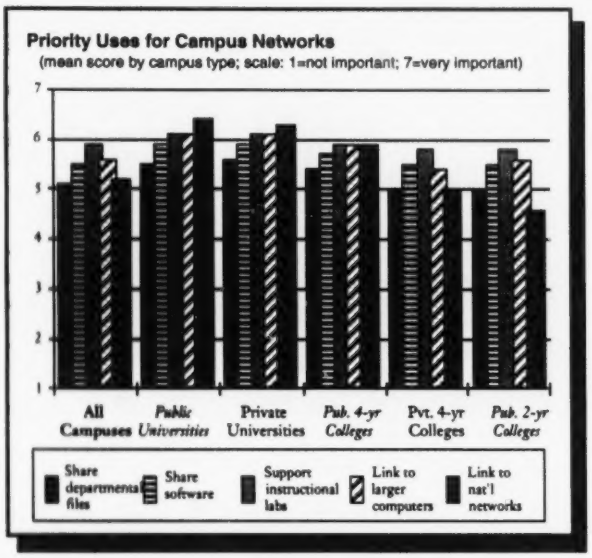

Figure 11

Maintaining the Infrastructure

Given the fast pace at which new technology comes to the market, it is not surprising that over two-thirds of the nation's campuses report that "upgrading aging hardware" will be a very important institutional priority over the next few years. Similarly, 64 percent indicate that replacing aging software will be a high priority (Figure 12).

However, even though institutions are concerned about the short "half-life" of computing equipment and the costs of replacing technologically obsolete hardware and software, the vast majority of the nation's colleges and universities (84 percent) report that efforts to upgrade or replace equipment in campus labs, classrooms, and faculty offices reflect opportunistic rather than planned purchases (Figure 12). Fully half

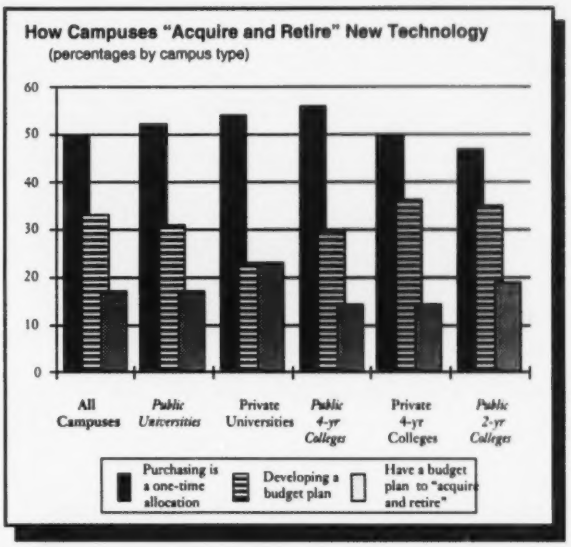

Figure 12

(51 percent) report that "most institutional purchases are acquired through a special, one-time [budget] allocation;" another third (33 percent) indicate their institution is moving towards a budget model to replace aging equipment, but that they still "generally purchase equipment on a one-time allocation." Only a sixth of the nation's colleges (16 percent) report that they currently have a budget mechanism that helps the campus "routinely 'acquire and retire' new technology."

The 1990 survey is the first of what EDUCOM and USC hope will be a continuing series of research projects that explore the ways campuses are utilizing desktop computing as a resource for instruction and research.

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CAMPUS COMPUTING 1990

The EDUCOM•USC Survey of Desktop Computing in Higher Education

Survey Data

GENERAL CAMPUS POLICIES ABOUT DESKTOP COMPUTING	ALL CAMPUSES	Public University	Private University	4-Yr Public College	4-Yr Private College	2-Yr Public College
Do you have formal policy on computers:						
for curriculum utilization?	30.1	19.5	16.7	26.4	37.1	28.7
for undergraduates?	32.3	25.3	22.9	26.9	43.0	26.7
for graduate students?	9.7	17.2	14.6	17.8	11.8	1.3
for faculty?	26.9	19.5	22.9	29.4	32.2	22.3
Micros required/strongly recommended*						
None	85.6	80.5	62.5	86.3	81.8	93.1
Specific disciplines	6.7	12.6	20.8	7.6	6.1	3.8
Individual units	1.8	3.4	6.3	2.5	1.5	.8
All students	5.8	4.6	14.6	5.1	9.8	1.3
O/S recommended/supported*						
Apple II	39.0	28.7	18.8	48.7	35.6	42.3
Macintosh	64.9	90.8	89.6	72.1	61.2	56.4
UNIX	37.6	78.2	64.6	47.7	35.9	22.1
MS/PC-DOS	93.6	94.3	93.8	95.9	91.4	94.6
OS/2	15.1	36.8	16.7	14.7	7.1	18.7
None recommended	3.7	5.7	4.2	3.0	3.7	3.6
Are there recommended brands*						
for students?	30.1	32.2	54.2	30.5	36.6	19.7
for faculty?	43.1	41.4	58.3	52.3	46.4	33.6
for admin./staff?	50.8	43.7	66.7	59.4	53.8	42.8

Percentages by Campus Category
(*Columns may total more than 100% since responses were not exclusive)

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GENERAL CAMPUS POLICIES ABOUT DESKTOP COMPUTING	ALL CAMPUSES	Public University	Private University	4-Yr Public College	4-Yr Private College	2-Yr Public College
What desktop computers recommended*						
Apple II series	8.6	5.7	2.1	12.2	8.1	8.7
Macintosh Plus/SE	27.0	34.5	45.8	33.0	30.0	16.9
Macintosh SE/30, Mac II	31.6	49.4	64.6	43.7	28.7	20.5
XT-level	14.2	10.3	10.4	13.2	16.5	13.6
AT-level/'286 units	34.2	36.8	35.4	38.6	36.1	29.2
IBM PS/2 Systems	34.8	43.7	39.6	37.1	29.7	36.4
IBM '386 systems	32.7	41.4	54.2	39.6	28.3	29.2
DEC	7.7	23.0	20.8	12.2	5.2	3.1
What workstations are recommended*						
HP/Apollo	3.3	9.2	10.4	3.0	3.2	1.3
IBM	6.5	14.9	16.7	7.6	3.4	5.9
NeXT	3.2	14.9	12.5	3.6	2.2	.3
Sun	7.8	35.6	29.2	10.7	5.2	.3

Percentages by Campus Category
(*Columns may total more than 100% since responses were not exclusive)

CURRENT MICROCOMPUTER AND DESKTOP COMPUTER FACILITIES	ALL CAMPUSES	Public University	Private University	4-Yr Public College	4-Yr Private College	2-Yr Public College
Total number of institutionally-owned desktop computers on campus today?.....	561.9	2736.7	1692.2	611.3	191.6	295.7
Students per institutionally-owned desktop computer or workstation (Enrollment divided by number of desktop computers).....	19.7	10.3	12.2	15.1	13.3	32.4
Total number of desktop computers used on your campus today?.....	884.0	4159.3	3403.9	933.2	346.6	344.4
Students per all desktop computers currently used on campus (Enrollment divided by reported total).....	15.2	7.5	7.2	11.7	9.2	26.8
Total number of computer labs, clusters and classrooms on campus this term?....	19.0	22.5	14.8	27.8	9.9	23.9
Total number of workstations in all the labs?.....	179.4	484.0	250.4	211.0	80.5	191.8
Students per instutionally-owned computers available in labs or clusters (Enrollment divided by lab totals).....	47.4	50.2	45.0	46.5	49.0	45.8
Ratio of lab desktop computers to total institutionally-owned desktop computers	.6	.3	.3	.5	.5	.9

Means by Campus Category

CURRENT MICROCOMPUTER AND DESKTOP COMPUTER FACILITIES	ALL CAMPUSES	Public University	Private University	4-Yr Public College	4-Yr Private College	2-Yr Public College
Proportion of students who have or own computers?	16.5	18.5	29.6	16.0	16.7	14.2
Proportion of faculty who have or own computers?	37.1	44.9	53.6	38.8	40.8	28.6
Proportion of administrators who have or own computers?	35.2	39.3	46.6	35.7	36.1	31.7
Est. desktop units purchased 1988-89:						
by students	146.2	678.9	449.9	119.9	42.0	71.6
by faculty	44.8	210.9	132.1	43.8	23.8	16.8
by admin	31.0	146.2	110.7	28.8	11.7	13.9
by labs	49.3	136.5	104.1	54.0	21.4	49.7
Est. desktop units purchased 1989-90:						
by students	164.6	689.8	515.9	129.9	56.4	94.9
by faculty	48.4	228.2	137.2	51.3	25.8	20.1
by admin	32.6	150.0	111.6	30.5	13.5	17.2
by labs	55.0	175.7	96.4	61.0	23.0	56.2

Means by Campus Category

CURRENT MICROCOMPUTER AND DESKTOP COMPUTER FACILITIES	ALL CAMPUSES	Public University	Private University	4-Yr Public College	4-Yr Private College	2-Yr Public College
No specific lab charge to students to use campus computer labs.....	66.2	56.3	68.8	73.1	65.6	65.1
Specific charge for use of labs?:						
included in student fees.....	12.0	23.0	8.3	13.7	11.3	9.7
included in course fees.....	17.8	16.1	14.6	8.1	19.4	21.8
hourly rates.....	1.2	2.3	8.3	.5	1.0	.8
printing.....	5.2	14.9	10.4	6.1	6.1	1.0
other.....	4.9	11.5	8.3	4.6	4.4	3.6

Percentages by Campus Category

HARDWARE/SOFTWARE ACQUISITION POLICIES AND PROCEDURES	ALL CAMPUSES	Public University	Private University	4-Yr Public College	4-Yr Private College	2-Yr Public College
Does your campus have a special resale agreement with hardware vendors?						
No resale program	34.8	11.5	8.3	20.8	36.6	48.5
No but sell computers on-campus	1.0	.0	.0	1.5	.7	1.3
Campus bookstore	20.1	35.6	22.9	34.5	12.5	16.9
Campus center	26.0	35.6	62.5	19.3	33.4	15.1
Off-campus dealer	16.8	17.2	6.3	22.8	14.7	17.2
Are computer buyers required to purchase bundled software?	6.0	4.6	20.8	3.0	10.1	1.8
Are computer buyers encouraged to purchase software?	27.9	36.8	54.2	34.5	32.7	14.4
Does your campus have a special resale agreement with software vendors?						
No resale program	55.8	17.2	20.8	49.7	54.5	73.1
No but sell software on-campus	2.7	3.4	4.2	3.6	3.4	1.0
Campus bookstore	14.9	33.3	22.9	20.8	10.6	11.3
Campus center	16.7	36.8	45.8	13.7	21.1	5.6
Off-campus dealer	8.3	6.9	6.3	10.2	8.6	7.7
Does your campus have a written policy on copyrighted software/piracy?						
No	29.4	19.5	31.3	24.4	30.2	33.1
Under development	20.9	17.2	14.6	22.3	20.4	22.3
Yes	48.2	62.1	54.2	53.3	46.9	43.1
Has your campus reviewed the EDUCOM Code?						
No	58.4	28.7	16.7	51.8	59.7	72.1
Yes--not adopted	8.1	12.6	12.5	8.6	6.9	7.4
Yes--adopted	29.0	55.2	66.7	37.6	29.2	13.8

Percentages by Campus Category

ACADEMIC & INSTRUCTIONAL COMPUTING POLICIES AND PROCEDURES	ALL CAMPUSES	Public University	Private University	4-Yr Public College	4-Yr Private College	2-Yr Public College
Does your campus have a formal plan for integrating computers in curriculum?...	27.8	16.1	20.8	26.9	28.5	31.0
Does your campus have formal projects for developing instructional courseware?.....	28.5	55.2	52.1	33.5	20.6	25.4
Does your campus have support for faculty developing instructional courseware?.....	40.7	49.4	60.4	37.6	31.4	47.4
Does your campus provide support for faculty to develop research software?..	26.2	44.8	45.8	34.0	24.8	17.2
Does your campus have a policy for rewarding courseware development?.....	12.9	18.4	8.3	12.7	9.6	15.9
Does your campus have a royalty-sharing program for faculty courseware?.....	16.4	49.4	35.4	19.8	7.4	14.4
Does your campus have a library of academic software for faculty evaluation?.....	39.5	46.0	56.3	42.6	34.9	39.2
Does your campus have an agreement for duplication/distribution of software?..	35.2	63.2	56.3	37.1	33.2	27.4

Percentages by Campus Category

FUTURE ISSUES AFFECTING CAMPUS COMPUTING HOW IMPORTANT OVER NEXT 2-3 YEARS?	ALL CAMPUSES	Public University	Private University	4-Yr Public College	4-Yr Private College	2-Yr Public College
Operating systems						
MS/PC-DOS	5.4	5.1	5.0	5.4	5.2	5.7
MS-DOS & Windows	5.1	5.2	5.1	5.1	4.7	5.3
OS/2	3.3	3.5	3.1	3.3	2.8	3.7
Presentation Manager	2.9	3.3	3.1	3.0	2.5	3.1
Macintosh System 7	3.7	4.3	5.2	4.1	3.6	3.1
UNIX	4.3	5.4	5.3	4.8	4.3	3.5
Motif	2.1	3.3	3.0	2.2	2.0	1.6
Open Look	2.0	2.7	2.8	2.1	1.8	1.7
New Wave	1.9	2.1	2.4	2.0	1.9	1.8
NeXTStep	2.2	2.8	2.6	2.2	2.1	1.9
Windowing and GUIS	5.0	5.7	5.9	5.1	4.9	4.8
Hardware						
Laptop computers	4.1	4.1	4.3	4.2	3.9	4.1
386 and '386 SX CPUs	5.4	5.6	5.8	5.5	5.1	5.4
IBM's Microchannel Bus	3.5	4.0	3.8	3.6	3.1	3.7
EISA Bus	3.2	3.9	4.0	3.4	3.0	3.1
UNIX Workstations	3.9	5.4	5.1	4.4	3.9	3.1
Diskless Workstations	3.3	3.9	3.7	3.4	3.3	3.1
RISC-based CPUs	3.4	4.9	4.8	3.8	3.2	2.7
Resale and Distribution						
Hardware resale contracts	3.7	4.1	5.4	3.8	4.1	2.8
Software resale contracts	3.5	4.5	5.1	3.6	3.9	2.7
Software site licensing	5.3	5.7	6.1	5.6	5.4	4.9

Means by Campus Category
(Scale from 1 "Not Important" to 7 "Very Important")

FUTURE ISSUES AFFECTING CAMPUS COMPUTING HOW IMPORTANT OVER NEXT 2-3 YEARS?	ALL CAMPUSES	Public University	Private University	4-Yr Public College	4-Yr Private College	2-Yr Public College
Networking						
Local area networks	6.2	6.5	6.5	6.4	6.1	6.1
Campus-wide networks	6.1	6.7	6.7	6.5	5.9	6.0
Merging data/telecomm networks	5.1	5.3	5.4	5.3	4.8	5.2
Connect PC-LANS to campus networks	5.7	6.4	6.4	6.2	5.4	5.5
Electronic mail	5.8	6.2	6.3	6.0	5.6	5.6
User support & service						
User support & training	6.1	6.3	6.1	6.3	6.1	6.0
Charging for previously free services	3.3	3.5	3.3	3.5	3.3	3.3
Upgrading aging hardware	5.9	5.9	5.7	6.0	5.8	6.0
Upgrading aging software	5.8	5.7	5.4	5.8	5.7	5.9
Software site licensing	5.9	5.9	6.0	6.1	5.7	5.9
Instructional applications						
Developing instructional software	4.2	4.5	4.5	4.1	4.1	4.3
Instructional software in classes	5.6	5.3	5.2	5.5	5.6	5.9
Instructional software as supplement	5.8	5.6	5.6	5.7	5.7	6.0

Means by Campus Category
(Scale from 1 "Not Important" to 7 "Very Important")

BEST COPY AVAILABLE

STRATEGIC PLANNING ISSUES: HOW IMPORTANT OVER NEXT 2-3 YEARS?	ALL CAMPUSES	Public University	Private University	4-Yr Public College	4-Yr Private College	2-Yr Public College
Assessing benefits of existing investments in computing resources.....	5.3	5.0	5.5	5.1	5.3	5.5
Clarifying goals and campus plans for technology resources.....	6.0	6.0	6.0	6.0	6.1	6.0
Providing rewards for faculty to support technology curriculum integration.....	4.8	4.7	5.2	4.8	4.7	4.8
Allocating campus funds to support expanded services.....	5.8	6.0	5.9	5.8	5.7	5.8
Faculty concerns about the benefits of computing in the curriculum.....	5.1	4.9	5.3	5.1	5.0	5.2
Administrative concerns about benefits of computing in the curriculum.....	5.0	4.6	5.0	4.9	5.0	5.1
Developing/strengthening vendor relationships.....	4.5	5.0	4.8	4.5	4.5	4.4

Means by Campus Category
(Scale from 1 "Not Important" to 7 "Very Important")

STRATEGIC PLANNING ISSUES: HOW IMPORTANT OVER NEXT 2-3 YEARS?	ALL CAMPUSES	Public University	Private University	4-Yr Public College	4-Yr Private College	2-Yr Public College
Charging fees to students for desktop computer access	3.3	4.0	2.7	3.4	3.1	3.3
Establishing/maintaining campus-wide standards for hardware	5.3	4.9	5.0	5.4	5.2	5.5
Establishing/maintaining campus-wide standards for software	5.4	5.1	5.2	5.5	5.3	5.6
Integrating computing services with allied service departments	5.6	5.7	5.9	5.5	5.7	5.6
Expanding computer networking across the campus	6.1	6.5	6.7	6.3	5.9	5.9
Operating a computer resale program for students and faculty	3.7	4.2	4.8	3.6	4.1	3.3
Developing budget mechanisms to replace aging equipment on a routine basis	5.9	5.8	5.7	6.0	6.0	5.9

Means by Campus Category
(Scale from 1 "Not Important" to 7 "Very Important")

LIBRARIES AND COMPUTING	ALL CAMPUSES	Public University	Private University	4-Yr Public College	4-Yr Private College	2-Yr Public College
Does your campus have desktop computers in the library?	75.7	83.9	87.5	84.8	72.5	71.3
Library patrons use computers for:						
catalog access	43.4	60.9	52.1	51.8	33.4	44.6
database access	40.4	51.7	43.8	44.2	37.1	39.0
open access use	32.9	42.5	35.4	35.5	27.3	35.1
word processing	46.9	44.8	45.8	48.2	47.9	45.9
CD ROM access	54.8	72.4	72.9	67.5	50.9	46.4
Has your library catalog been automated?	52.3	89.7	72.9	62.4	40.3	49.0

Percentages by Campus Category

NETWORKING: HOW IMPORTANT ARE THESE ISSUES IN PLANNING FOR NETWORKING	ALL CAMPUSES	Public University	Private University	4-Yr Public College	4-Yr Private College	2-Yr Public College
Connecting desktop systems to share departmental or workgroup files.....	5.2	5.5	5.6	5.4	5.0	5.0
Connecting desktop systems to share software resources.....	5.6	5.9	5.9	5.6	5.5	5.5
Supporting instructional labs and clusters.....	5.9	6.1	6.1	6.0	5.8	5.9
Intradepartmental mail systems on LANS.	4.6	5.0	5.2	4.9	4.3	4.5
Campus-wide mail systems on a network..	5.2	6.1	6.2	5.6	5.0	4.9
Linking PCs to larger computing systems	5.7	6.1	6.1	5.9	5.4	5.6
Linking your campus with regional or national networks.....	5.2	6.4	6.2	5.9	5.0	4.6

Means by Campus Category
(Scale from 1 "Not Important" to 7 "Very Important")

NETWORKING	ALL CAMPUSES	Public University	Private University	4-Yr Public College	4-Yr Private College	2-Yr Public College
Networks currently installed:						
Fiber	30.8	79.3	60.4	41.6	23.1	19.0
ISDN	2.9	12.6	8.3	4.6	1.0	1.3
Ethernet/Coax	58.3	89.7	87.5	70.1	52.1	48.2
Twisted Pair	54.4	85.1	77.1	59.9	49.1	47.4

Percentages by Campus Category

NETWORKING: WHO HAS ACCESS TO E-MAIL	ALL CAMPUSES	Public University	Private University	4-Yr Public College	4-Yr Private College	2-Yr Public College
Students who use e-mail.....	12.7	17.2	24.1	11.6	16.1	3.6
Faculty who use e-mail.....	19.5	31.3	27.4	20.9	18.5	13.6
Administrators who use e-mail.....	29.3	31.5	28.5	29.5	22.9	34.3
Staff who use e-mail.....	24.5	26.0	27.5	24.9	20.3	27.0

Mean Percentage by Campus Category

COMPUTING FOR DISABLED STUDENTS	ALL CAMPUSES	Public University	Private University	4-Yr Public College	4-Yr Private College	2-Yr Public College
How would you describe arrangements for computer access for disabled end-users?						
Centralized access	15.8	14.9	16.7	18.3	14.0	16.4
Segmented access	7.8	9.2	4.2	11.2	3.2	11.0
Mixed access	17.2	34.5	18.8	21.3	4.7	24.1
General access	54.7	39.1	56.3	46.7	71.7	44.1
Is your campus currently reviewing the computing needs of disabled students?						
No plans	58.3	43.7	52.1	60.4	73.5	45.4
No--completed review	10.5	12.6	8.3	13.7	3.9	15.4
Review underway	16.3	26.4	16.7	16.2	9.8	20.8
Review next year	9.8	14.9	12.5	6.6	8.1	11.8
How well does your campus deal with the 'life cycle' issues of desktop computers						
One-time allocation	49.1	50.6	52.1	56.3	48.6	45.1
Developing plan	32.8	29.9	22.9	29.4	35.6	33.3
Have Plan	15.9	17.2	22.9	13.7	13.8	17.9

Percentages by Campus Category

GENERAL CAMPUS POLICIES ABOUT DESKTOP COMPUTING	ALL CAMPUSES	Public University	Private University	4-Yr Public College	4-Yr Private College	2-Yr Public College
How well train in tech. challenges:						
for students in bio/phys. sci.?.....	3.4	3.5	3.4	3.4	3.4	3.3
for students in business?.....	3.9	4.1	3.9	3.8	3.7	4.0
for students in education?.....	3.2	3.0	3.3	3.2	3.3	3.1
for students in engineering?.....	3.9	4.2	4.1	3.9	3.8	3.8
for students in fine/perf. arts?.....	2.9	2.9	2.8	2.9	2.9	2.9
for students in humanities?.....	2.9	2.7	2.9	2.9	2.9	3.0
for students in social science?.....	3.1	3.1	3.3	3.1	3.2	2.9

Means by Campus Category
(Scale from 1 "Poor" to 5 "Excellent")

CAMPUS COMPUTING 1990

The EDUCOM•USC Survey of Desktop Computing in Higher Education

Appendices

A. Methodology

B. Survey Form

C. Participating Institutions

Appendix A

Methodology

The 1990 EDUCOM•USC Survey of Desktop computing was designed to collect information about campus planning, policies, and procedures affecting the use of desktop computers (i.e., personal computers and workstations) from colleges and universities in the United States (including Alaska and Hawaii).

The 1990 survey was mailed to some 2500 campuses in the United States early in May, 1990. Questionnaires were sent to all four-year colleges and universities, plus a one-half sample of the nation's two-year public and private institutions. Small branch campuses of multi-campus districts enrolling only a few hundred students and some two- and four-year institutions that admit less than one hundred students annually were omitted from the survey sample.

Questionnaires were mailed to the institution's EDUCOM representative, if the campus was a member of EDUCOM, or to the director of academic computing. In those instances where it where it not possible to identify, by name, an individual in the role of director of academic or campus computing, the questionnaire was then mailed to the chief academic officer of the institution.

A second wave of survey instruments were mailed to nonresponding institutions early in July. A total of 1148 campuses returned completed and usable questionnaires by mid-September, the closing date for the data analysis. The number of participating campuses are listed below, by campus type:[1]

Public Research Universities	87
Private research Universities	48
Public Four-Year Colleges	197
Private Four-Year Colleges	407
Public Two-Year Colleges	390
Private Two-Year Colleges	19

The response rate to the survey was 45.8 percent. However, within some segments of campus types, the response rate was well over 80 percent (for example, both public and private universities). Among public two-year colleges, the response rate (about 40 percent) is very good for this type of survey and reflects a rich array of institutional responses. Similarly, while less than half of the nation's private four-year colleges responded to the survey, the data from these institutions is nonetheless quite varied and consequently very rich with information about computing practices and policies within these types of institutions. The small number of private two-year campuses responding to the survey was the reason why survey results for these institutions are not reported.

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[1] The institutional typology presented here and used in the survey analysis and report reflects a variation on the widely-used Carnegie model (Carnegie Advancement for the Foundation of Teaching, Princeton, NJ). This model has also been used by UCLA's Higher Education Research Institute for the annual American Council on Education-UCLA Cooperative Institutional Research Program Survey of Entering Freshmen.

Appendix B

EDUCOM•USC National Survey of Desktop Computer Use in Higher Education

SPRING 1990

Dear Colleague:

This survey is part of a national project focused on campus policies, plans, and procedures affecting desktop computing in two- and four-year colleges and universities. Your responses will contribute to a better understanding of the ways campuses across the country are planning for and using desktop computers.

Please take a few minutes to complete this questionnaire. All responses will be treated in a confidential manner.

Thank you for your assistance.

Kenneth C. Green, Ph.D.
Project Director

MAILING LABEL

Please attach a business card with the correct name, title, and address of survey respondent. Updated addresses will be used to send you a copy of the survey results.

Please respond to all questions based on institutional policies, i.e., policies that apply broadly to students, faculty, administrators and staff in all units of your institution.

A. General Campus Policies About Desktop Computing

1. Does your campus have a formal policy promoting or mandating computers/computing resources for

curriculum utilization?	① no	② yes
undergraduates?	① no	② yes
graduate students?	① no	② yes
faculty?	① no	② yes

2. Does your institution have a *computer instruction* or *computer competency* requirement for all undergraduates?
   ① no ② yes
3. Does your campus have a formal policy about the *confidentiality of computer data?*
   ① no ② yes
4. Does your campus have a formal policy regarding the *development of software* by faculty and staff?
   ① no ② yes
5. Please check the *Operating Systems* recommended or supported by your institution:
   - ❑ Apple II
   - ❑ Macintosh
   - ❑ UNIX
   - ❑ MS-DOS/PC DOS
   - ❑ OS/2
   - ❑ Other: _____
   - ❑ None (my campus *has not* recommended a specific operating system.)
6. Does your institution *require* or *strongly recommend* microcomputer ownership? *(please check all that apply)*
   - ❑ no
   - ❑ yes, for students in specific disciplines or programs
   - ❑ yes, for students in individual academic units or schools
   - ❑ yes, for all students

   Please list depts./units that require or recommend computer ownership:
   _____
   _____
   _____
   _____
7. Does your institution (or individual units or programs) specifically recommend a particular brand or products for

students?	① no	② yes
faculty?	① no	② yes
administrators/staff?	① no	② yes

If you answered "yes" to any part of #7, please go on to #8; otherwise, please go on to #9.

please go on to the next page ➨

8. Please check the brand(s)/kinds(s) of *desktop* computer system(s) generally recommended by your institution:

Apple	IBM & IBM Compatibles	UNIX Systems
❑ Apple II series	❑ XT-level	❑ DEC
❑ Macintosh Plus/SE (68000 series)	❑ AT-level/'286 units	❑ HP/Apollo
❑ Macintosh SE/30 or Mac II series	❑ IBM PS/2 Systems	❑ IBM
	❑ '386 systems	❑ NeXT
	❑ other:_____	❑ Sun
		❑ other:_____

B. Current Microcomputer and Desktop Computer Facilities

9. What is your *best estimate* of the total number of *institutionally-owned* desktop computers and workstations on your campus today? (Please include systems in faculty offices and in labs, clusters, classrooms, residence halls, etc.)

|_|_|_|_|_|

10. What is your best estimate of the *total* number of desktop computers *used* on your campus today (including personally purchased systems owned by students and faculty)?

|_|_|_|_|_|

11. What is your best estimate of the proportion of individuals in your campus community who have or own desktop computers?

students	|_|_| %
faculty	|_|_| %
administrators	|_|_| %

12. Estimated total number of desktop units purchased by:

	1988-89	1989-90
students	|_|_|_|_|	|_|_|_|_|
faculty (personal & office/project use)	|_|_|_|_|	|_|_|_|_|
administrators (personal & office/project use)	|_|_|_|_|	|_|_|_|_|
campus labs, clusters & other instructional use	|_|_|_|_|	|_|_|_|_|

13. Total number of *desktop computer labs, clusters,* and *classrooms* on your campus this term?

|_|_|_|

14. How many of these computer labs/clusters/classrooms are specifically dedicated for use by individual departments or units (e.g., writing program, engineering, social science)?

|_|_|_|

15. Total number of *microcomputers and workstations* in *all* the labs/classrooms/clusters on your campus?

|_|_|_|_|_|

16. Is there a specific charge *to students* for use of the labs? (Please mark all that apply.)
    - ❑ no
    - ❑ yes, included in student fees
    - ❑ yes, included in course fees
    - ❑ yes, hourly rates
    - ❑ yes, for printing
    - ❑ yes, other: _____

17. Who may reserve lab facilities? (Please mark all that apply.)
    - ❑ no reservation policy
    - ❑ labs may not be reserved (permanent open-access facilities)
    - ❑ individual students for their own work
    - ❑ groups of students for special projects
    - ❑ faculty for classes or seminars
    - ❑ off-campus groups for special seminars

C. Hardware Acquisition Policies and Procedures

18. Does your institution have a special pricing or resale agreement with one or more *hardware* vendors?
    - ① no, we do not have any kind of computer resale program. *(please go on to #20.)*
    - ② no, we do not have a special discount program although we do sell computers through an on-campus facility. *(please go on to #20.)*
    - ③ yes, for hardware sold through the campus bookstore.
    - ④ yes, for hardware sold through a special campus center or outlet *not* affiliated with our bookstore.
    - ⑤ yes, for hardware sold by special agreement with an off-campus dealer.

please go on to the next page ➨

19. If *yes* to the preceding question, please list below or attach a separate list of the companies involved in *hardware* resale programs with your campus.

Company

_____ _____
_____ _____
_____ _____
_____ _____
_____ _____

20. Does your institution *require* buyers to purchase bundled software as part of the resale program?
① no ② yes

21. Does your institution *encourage* buyers to purchase software as part of the resale program?
① no ② yes

22. Does your institution offer financial assistance to students and/or faculty to purchase computer hardware?
① no (go on to #23) ② yes

If yes, please check all types of assistance offered:

Type of Assistance	Students	Faculty
Loans	❑	❑
Grants	❑	❑
Financial aid (students only)	❑	
Other: _____	❑	❑

D. Software Utilization Issues

23. Does your institution have policies and/or procedures regarding the *duplication of copyrighted software* and *software piracy*? (Please mark all that apply.)

- ❑ general promotional effort on campus
- ❑ information in the student handbook
- ❑ information in the faculty handbook
- ❑ information in the staff handbook
- ❑ discussion in training classes
- ❑ discussion in new student orientation
- ❑ discussion in faculty orientation
- ❑ discussion in staff orientation
- ❑ information distributed with computer purchases
- ❑ potential for sanctions against students
- ❑ potential for sanctions against faculty
- ❑ potential for sanctions against staff
- ❑ no organized institutional activity

24. Does your institution have a written policy regarding the *duplication of copyrighted software/software piracy*?
① no
② no, but under development
③ yes (effective date: _____)

25. Has your institution reviewed the EDUCOM Code regarding the duplication of copyrighted software?
① no
② yes, but we decided not to adopt or endorse it here.
③ yes, and we have endorsed it or modified it as part of our institutional policy.

E. Software Acquisition Policies and Procedures

26. Does your institution have a special pricing or resale agreement with one or more software vendors?
① no, we do not have a software resale program. *(please go on to #27.)*
② no, we do not have a special discount program although we do sell software through an on-campus facility. *(please go on to #27.)*
③ yes, for software sold through the campus bookstore.
④ yes, for software sold through a special campus center or outlet *not* affiliated with our bookstore.
⑤ yes, for software sold by special agreement with an off-campus dealer.

If yes, please list below or attach a separate list of companies involved in *software* resale programs with your campus.

Company

_____ _____
_____ _____

please go on to the next page ➨

27. Has your campus set specific *software* product standards or strongly recommended specific software products?
① no (go on to #28) ② yes

If yes, please indicate which products are *standards* or are *strongly recommended* on your campus.

	MS-DOS	Macintosh
Word Processing		
Microsoft Word	❑	❑
WordPerfect	❑	❑
Multimate/FullWrite	❑	❑
WordStar	❑	
MacWriteII		❑
WriteNow		❑
Other	_____	_____
Spreadsheets		
Borland Quattro	❑	
Lotus 1-2-3	❑	❑
Microsoft Excel	❑	❑
Supercalc	❑	
Wingz		❑
Other	_____	_____
Integrated/Multifunction		
Enable	❑	
Framework	❑	
Microsoft Works	❑	❑
Symphony	❑	

	MS-DOS	Macintosh
Data Base Mgmt.		
dBase/dBase Mac	❑	❑
Rbase	❑	
FoxBase	❑	❑
Double Helix		❑
4th Dimension		❑
Other	_____	_____
Other	_____	_____
Statistical Software		
BMDP	❑	❑
SAS/JMP	❑	❑
SPSS	❑	❑
Systat	❑	❑
MiniTab	❑	
Other	_____	_____

F. Academic & Instructional Computing Policies and Procedures

28. Does your campus have a formal plan for integrating desktop computers into the curriculum?
① no ② yes

29. Does your campus have one or more formal projects for developing desktop instructional software/courseware?
① no ② yes ➘
number of current projects: ___

30. Does your campus provide any formal support or assistance (e.g, funding, release time, technical assistance) to help faculty who wish to develop *instructional* software/courseware?
① no ② yes

31. Does your campus provide any formal support or assistance (e.g, funding, release time, technical assistance) to assist faculty who may wish to develop software to assist their *research*?
① no ② yes

32. Does your campus have a policy or program for rewarding courseware development or providing incentives for faculty to develop instructional software/courseware?
① no ② yes

33. Does your campus have a royalty-sharing program for faculty who develop instructional software/courseware using campus resources and/or staff?
① no ② yes

34. Does your campus maintain a library of academic courseware for faculty review and evaluation?
① no ② yes

35. Does your campus have an agreement or license for on-campus duplication and distribution of desktop computer software products?
① no *(go on to #36)* ② yes
If yes, please list the names of the companies that license software to your campus below:

Company

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

please go on to the next page ➨

G. Future Issues Affecting Campus Computing

36. As you think about future of computing at your institution, please indicate how *important* you see the following items in the overall campus computing environment and computing policy over the next 2-3 years.

	Not Important						*Very Important*
Operating System/Interface/Development							
MS-DOS/PC-DOS	①	②	③	④	⑤	⑥	⑦
MS-DOS & Windows	①	②	③	④	⑤	⑥	⑦
OS/2	①	②	③	④	⑤	⑥	⑦
Presentation Manager	①	②	③	④	⑤	⑥	⑦
Macintosh System 7	①	②	③	④	⑤	⑥	⑦
UNIX	①	②	③	④	⑤	⑥	⑦
Motif	①	②	③	④	⑤	⑥	⑦
Open Look	①	②	③	④	⑤	⑥	⑦
New Wave	①	②	③	④	⑤	⑥	⑦
NeXTStep	①	②	③	④	⑤	⑥	⑦
Windowing and Graphical User Interfaces	①	②	③	④	⑤	⑥	⑦
Hardware							
Laptop computers	①	②	③	④	⑤	⑥	⑦
'386 and '386 SX CPUs	①	②	③	④	⑤	⑥	⑦
IBM's Microchannel Bus	①	②	③	④	⑤	⑥	⑦
EISA Bus	①	②	③	④	⑤	⑥	⑦
UNIX Workstations	①	②	③	④	⑤	⑥	⑦
Diskless Workstations	①	②	③	④	⑤	⑥	⑦
RISC-based CPUs	①	②	③	④	⑤	⑥	⑦
Resale and Distribution							
Hardware resale contracts	①	②	③	④	⑤	⑥	⑦
Software resale contracts	①	②	③	④	⑤	⑥	⑦
Software site licensing	①	②	③	④	⑤	⑥	⑦

	Not Important						*Very Important*
Networking							
Local area networks	①	②	③	④	⑤	⑥	⑦
Campus-wide networks	①	②	③	④	⑤	⑥	⑦
Merging data & telecommunication networks	①	②	③	④	⑤	⑥	⑦
Connecting PC- LANS to campus-wide networks	①	②	③	④	⑤	⑥	⑦
Electronic mail	①	②	③	④	⑤	⑥	⑦
User Support & Service							
User support & training	①	②	③	④	⑤	⑥	⑦
Charging users for services now provided at little or no cost	①	②	③	④	⑤	⑥	⑦
Upgrading aging hardware	①	②	③	④	⑤	⑥	⑦
Upgrading aging software	①	②	③	④	⑤	⑥	⑦
Software site licensing	①	②	③	④	⑤	⑥	⑦
Instructional Applications							
Developing instructional software	①	②	③	④	⑤	⑥	⑦
Using instructional software in classes	①	②	③	④	⑤	⑥	⑦
Using instructional software as a supplement to classes	①	②	③	④	⑤	⑥	⑦

H. Strategic Planning Issues

37. As you look at the future of computing on your campus, please indicate how important the following computing/technology issues will be in the overall campus computing environment over the next 2-3 years.

	Not Important						*Very Important*	*Not Applicable*
Assessing the benefits of existing investments in computing and technology resources	①	②	③	④	⑤	⑥	⑦	⑧
Clarifying goals and campus plans for technology resources	①	②	③	④	⑤	⑥	⑦	⑧
Providing incentives and rewards for faculty to support technology integration into the curriculum	①	②	③	④	⑤	⑥	⑦	⑧
Allocating campus funds to support expanded services	①	②	③	④	⑤	⑥	⑦	⑧
Faculty concerns about the benefits of computing in the curriculum	①	②	③	④	⑤	⑥	⑦	⑧
Administrative concerns about the benefits of computing in the curriculum	①	②	③	④	⑤	⑥	⑦	⑧
Developing/strengthening vendor relationships	①	②	③	④	⑤	⑥	⑦	⑧
Charging fees to students for desktop computer access	①	②	③	④	⑤	⑥	⑦	⑧
Establishing/maintaining campus-wide standards for *hardware*	①	②	③	④	⑤	⑥	⑦	⑧
Establishing/maintaining campus-wide standards for *software*	①	②	③	④	⑤	⑥	⑦	⑧
Integrating computing services with allied service departments (for example, library services)	①	②	③	④	⑤	⑥	⑦	⑧
Expanding computer networking across the campus	①	②	③	④	⑤	⑥	⑦	⑧
Operating a computer resale program for students and faculty	①	②	③	④	⑤	⑥	⑦	⑧
Developing budget mechanisms to replace aging equipment on a routine basis	①	②	③	④	⑤	⑥	⑦	⑧

please go on to the next page ➨

I. LIBRARIES AND COMPUTING

38. Does your campus have desktop computers in the library?
① no (skip to next question # 39) ② yes (go on to question below)
If yes, how do library users make use of these computers (please check all that apply):
❑ catalog access ❑ word processing
❑ database access ❑ CD ROM access
❑ open access use ❑ other: _____

39. Has your library catalog been automated?
① no (go on to next question # 40) ② yes (go on to question #41)

40. If NO: Does your campus have plans to automate the library card catalog in the next two years?
① no (go on to question #42) ② yes

41. If YES:
What system or vendor have you used to automate your card catalog? _____
Is the Card Catalog CPU located ① in the library? ② in the campus computer center? ③ elsewhere?

42. How does your library/library system provide access to bibliographic citation indexes?
❑ print ❑ dial-up access to off-campus *commercial* databases
❑ database on a campus CPU ❑ dial-up access to off-campus *educational* databases
❑ CD ROM
❑ other: _____

J. NETWORKING

43. How important are the following issues in discussions about and planning for networking on your campus?

	Not Important					*Very Important*		*Not Applicable*
Connecting desktop systems to share departmental or workgroup files	①	②	③	④	⑤	⑥	⑦	⑧
Connecting desktop systems to share software resources	①	②	③	④	⑤	⑥	⑦	⑧
Supporting instructional labs and clusters	①	②	③	④	⑤	⑥	⑦	⑧
*Intra*departmental mail systems on LANS	①	②	③	④	⑤	⑥	⑦	⑧
Campus-wide mail systems on a network	①	②	③	④	⑤	⑥	⑦	⑧
Linking PCs to larger computing systems	①	②	③	④	⑤	⑥	⑦	⑧
Linking your campus with regional or national networks	①	②	③	④	⑤	⑥	⑦	⑧

44. What kinds and types of networks are currently installed on your campus?
Kinds of Networks (Check all that apply.) *Vendors/products:*_____
❑ Fiber ❑ Ethernet/Coax _____ _____
❑ ISDN ❑ Twisted Pair _____
_____

45. Who has access to electronic mail accounts at your campus? (Please check all that apply and indicate your estimate of the percentage of these groups using e-mail.)
❑ students percentage of students who use e-mail? |__|__| %
❑ faculty percentage of faculty who use e-mail? |__|__| %
❑ administrators percentage of administrators who use e-mail? |__|__| %
❑ staff percentage of staff who use e-mail? |__|__| %

K. COMPUTING FOR DISABLED STUDENTS

46. How would you describe the organizational arrangements for providing computer access for disabled end-users?
① *centralized* access, through main and/or departmental computer centers.
② *segmented* access, through a special office specifically charged to assist disabled end-users.
③ *mixed* access, through both a special office and also through main and/or departmental computer centers.
④ *general access*, with no formal policy or procedure(s) for specifically serving disabled students.

47. Is your campus currently reviewing the computing needs of disabled students?
① no, and we have no plans to do so in the next year or so.
② no, because we recently completed this type of review.
③ yes, a review is now underway.
④ yes, a review is planned for the coming academic year (1990-1991).

please go on to the next page ➨

L. VENDOR ASSESSMENT

48. What is your assessment of the companies that sell desktop (i.e., personal computer and workstation) systems and software to the higher education market?

Ratings: ① Strongly Disagree (SD) ② Disagree ③ Agree ④ Strongly Agree (SA)

	Has Appropriate Products for Campus Users SD D A SA	*Understands Computing Issues Affecting My Campus* SD D A SA	*Will Play an Important Role in our Computing Plans for the Next 2-3 Years* SD D A SA
Hardware Vendors			
Apple	① ② ③ ④	① ② ③ ④	① ② ③ ④
AT&T	① ② ③ ④	① ② ③ ④	① ② ③ ④
Commodore/Amiga	① ② ③ ④	① ② ③ ④	① ② ③ ④
DEC (Digital)	① ② ③ ④	① ② ③ ④	① ② ③ ④
Dell	① ② ③ ④	① ② ③ ④	① ② ③ ④
IBM	① ② ③ ④	① ② ③ ④	① ② ③ ④
HP/Apollo	① ② ③ ④	① ② ③ ④	① ② ③ ④
NeXT	① ② ③ ④	① ② ③ ④	① ② ③ ④
SUN	① ② ③ ④	① ② ③ ④	① ② ③ ④
Zenith	① ② ③ ④	① ② ③ ④	① ② ③ ④
Other: _____	① ② ③ ④	① ② ③ ④	① ② ③ ④
Other: _____	① ② ③ ④	① ② ③ ④	① ② ③ ④
Software Vendors			
Ashton-Tate	① ② ③ ④	① ② ③ ④	① ② ③ ④
Auto-Cad	① ② ③ ④	① ② ③ ④	① ② ③ ④
Borland	① ② ③ ④	① ② ③ ④	① ② ③ ④
Claris	① ② ③ ④	① ② ③ ④	① ② ③ ④
Computer Associates	① ② ③ ④	① ② ③ ④	① ② ③ ④
Lotus	① ② ③ ④	① ② ③ ④	① ② ③ ④
Microsoft	① ② ③ ④	① ② ③ ④	① ② ③ ④
SAS	① ② ③ ④	① ② ③ ④	① ② ③ ④
Software Publishing Co.	① ② ③ ④	① ② ③ ④	① ② ③ ④
SPSS	① ② ③ ④	① ② ③ ④	① ② ③ ④
Other: _____	① ② ③ ④	① ② ③ ④	① ② ③ ④
Other: _____	① ② ③ ④	① ② ③ ④	① ② ③ ④

M. ORGANIZATION OF CAMPUS COMPUTING AND TECHNOLOGY UNITS

49. Is your campus part of a multicampus system with shared computing resources: ① no ② yes

50. Academic and administrative computing on your campus are: ① separate units ② one single unit

51. How does your campus coordinate academic computing and library operations? The heads of each unit report to:

Academic Computing
- ① president
- ② provost (chief academic officer)
- ③ vice president, (e.g., vp for information services)
- ④ dean
- ⑤ other: _____

Library
- ① president
- ② provost (chief academic officer)
- ③ vice president, (e.g., vp for information technology)
- ④ dean
- ⑤ other: _____

52. Has your institution reorganized computing or library services with the past two years?
Academic Computing ① no ② yes *Library* ① no ② yes

53. Do you anticipate a reorganization of computing or library services within the next two years?
Academic Computing ① no ② yes *Library* ① no ② yes

54. Is your chief academic officer directly involved (or interested) in campus planning for instructional technology?
① not interested or involved ② interested ③ somewhat involved ④ directly involved

please go on to the next page ➨

55. How does your institution deal with the "life cycle" issues affecting the institutional purchase (and upgrading/replacement) of desktop computers for faculty, classrooms, clusters, and labs?
    - ① Most institutional purchases of desktop systems are acquired through a special one-time allocation or appropriation.
    - ② Although we generally purchase equipment on a one-time allocation, we are developing a budget mechanism (or budget planning model) to help us routinely "acquire and retire" new technology.
    - ③ We have a budget mechanism (or budget planning model) to help us routinely "acquire and retire" new technology.

56. From your perspective, how well does your institution prepare your students (i.e., undergraduates) for the technology skills they will need and technology challenges they will encounter over the next decade?

Academic Field/Program	*Poor*				*Excellent*	*Not Applicable*
biological & physical sciences	①	②	③	④	⑤	⑥
business	①	②	③	④	⑤	⑥
education	①	②	③	④	⑤	⑥
engineering	①	②	③	④	⑤	⑥
fine & performing arts	①	②	③	④	⑤	⑥
humanities	①	②	③	④	⑤	⑥
social science	①	②	③	④	⑤	⑥

THANK YOU FOR YOUR ASSISTANCE!

PLEASE FOLD AND MAIL IN THE ENCLOSED POSTAGE-PAID ENVELOPE

Appendix C

Participating Institutions

Abilene Christian University, TX
Adrian College, MI
Aiken Technical College, SC
Alabama State University, AL
Alamance Community College, NC
Alaska Pacific University, AK
Albertus Magnus College, CT
Albright College, PA
Alcorn State University, MS
Alfred University, NY
Allegany Community College, MD
Allegheny College, PA
Allen County Community College, KS
Allentown College of St. Francis de Sales, PA
Alma College, MI
Alvernia College, PA
Alverno College, WI
Amarillo College, TX
Amber University, TX
American River College, CA
American University, DC
Ancilla College, IN
Andrew College, GA
Angelina College, TX
Anna Maria College for Men and Women, MA
Anne Arundel Community College, MD
Anoka-Ramsey Community College, MN
Anson Community College, NC
Antelope Valley College, CA
Antonelli Institute of Art and Photography, OH
Appalachian State University, NC
Arizona College of the Bible, AZ
Arkansas Baptist College, AR
Arkansas College, AR
Arkansas State University, AR
Arkansas Tech University, AR
Armstrong State College, GA
Asbury College, KY
Asheville-Buncombe Technical Community College, NC
Ashland University, OH
Atlanta Metropolitan College, GA
Auburn University at Montgomery, AL
Auburn University-Main Campus, AL
Augusta College, GA
Augustana College, IL
Augustana College, SD
Austin Community College, MN
Austin Community College, TX
Austin Peay State University, TN
Avila College, MO
Azusa Pacific University, CA
Babson College, MA
Bacone College, OK
Bakersfield College, CA
Baldwin-Wallace College, OH
Ball State University, IN
Bard College, NY
Barry University, FL
Baruch College of the City University of New York, NY
Bay de Noc Community College, MI
Baylor University, TX
Beaver College, PA
Becker Junior College - Leicester Campus, MA
Bee County College, TX
Bellevue College, NE
Belmont Abbey College, NC
Belmont Technical College, OH
Beloit College, WI
Bemidji State University, MN
Benedictine College, KS
Bennington College, VT
Bentley College, MA
Berea College, KY
Bergen Community College, NJ
Berkshire Community College, MA
Berry College, GA
Bethany College, KS
Bethany Lutheran College, MN
Bethel College, MN
Big Bend Community College, WA
Biola University, CA
Birmingham Southern College, AL
Bishop Clarkson College, NE
Black Hawk College - East Campus, IL
Black Hills State University, SD

Blackhawk Technical College, WI
Blinn College, TX
Blue Ridge Community College, VA
Bluffton College, OH
Boise State University, ID
Boston College, MA
Bowdoin College, ME
Bowling Green State University, OH
Bradley University, IL
Brazosport College, TX
Brescia College, KY
Brevard College, NC
Briarcliffe School, NY
Bridgewater State College, MA
Brigham Young Univ. -Main Campus, UT
Brigham Young Univ. - Hawaii Campus, HI
Bristol Community College, MA
Broward Community College, FL
Brown University, RI
Brunswick College, GA
Brunswick Community College, NC
Bryant College, RI
Bryn Mawr College, PA
Bucknell University, PA
Buena Vista College, IA
Burlington County College, NJ
Butler County Community College, KS
Butler University, IN
Cabrillo College, CA
Cabrini College, PA
Caldwell College, NJ
Caldwell Community College and Technical Institute, NC
Calif Polytechnic State Univ-San Luis Obispo, CA
Calif State Univ-Chico, CA
Calif State Univ-Fresno, CA
Calif State Univ-Fullerton, CA
Calif State Univ-Hayward, CA
Calif State Univ-Long Beach, CA
Calif State Univ-Los Angeles, CA
Calif State Univ-San Bernardino, CA
Calif State Univ-Stanislaus, CA
California Institute of the Arts, CA
California Lutheran University, CA
California Maritime Academy, CA
California Univ. of Pennsylvania, PA
Calumet College of Saint Joseph, IN
Calvin College, MI
Campbellsville College, KY
Canisius College, NY
Cape Fear Community College, NC
Capital University, OH
Carleton College, MN
Carlow College, PA
Carroll College, WI
Carroll College of Montana, MT
Carson-Newman College, TN
Carteret Community College, NC
Casco Bay College, ME
Casper College, WY
Catawba College, NC
Catholic University of America, DC
Catonsville Community College, MD
Cazenovia College, NY
Cecil Community College, MD
Cedar Valley College, TX
Centenary College, NJ
Centenary College of Louisiana, LA
Central Community College-Platte Campus, NE
Central Florida Community College, FL
Central Michigan University, MI
Central Oregon Community College, OR
Central Piedmont Community College, NC
Central State University, OK
Central University of Iowa, IA
Central Virginia Community College, VA
Central Washington University, WA
Central Wesleyan College, SC
Centralia College, WA
Centre College, KY
Cerritos College, CA
Chabot College, CA
Chadron State College, NE
Chaffey College, CA
Chaminade University of Honolulu, HI
Charles Stewart Mott Community College, MI
Charter Oak College, CT
Chatham College, PA
Chattanooga State Technical Community College, TN
Chemeketa Community College, OR
Chesterfield-Marlboro Technical College, SC
Chestnut Hill College, PA
Chipola Junior College, FL
Christ College Irvine, CA
Christendom College, VA
Christian Brothers College, TN
Cincinnati Technical College, OH
City Colleges of Chicago, Wilbur Wright College, IL
Claflin College, SC
Clark College, WA
Clark State Community College, OH
Clarke College, IA
Clatsop Community College, OR
Clayton State College, GA
Cleary College, MI
Cleveland Community College, NC
Cleveland State University, OH
Clinton Community College, IA
Coastal Carolina Community College, NC
Cochise College, AZ

Coe College, IA
Cogswell College North, WA
Coker College, SC
Colby College, ME
College Misericordia, PA
College of Charleston, SC
College of DuPage, IL
College of Idaho, ID
College of Lake County, IL
College of New Rochelle, NY
College of Notre Dame of Maryland, MD
College of Saint Benedict, MN
College of Saint Elizabeth, NJ
College of Southern Idaho, ID
College of St. Thomas, MN
College of the Canyons, CA
College of the Desert, CA
College of the Redwoods, CA
College of William and Mary, VA
College of Wooster, OH
Colorado Northwestern Community College, CO
Colorado State University, CO
Colorado Technical College, CO
Columbia College, MO
Columbia College, SC
Columbia State Community College, TN
Columbia-Greene Community College, NY
Columbus College, GA
Columbus State Community College, OH
Community College of Allegheny County Allegheny Campus, PA
Community College of Allegheny County Boyce Campus, PA
Community College of Allegheny County College Center -North, PA
Community College of Allegheny County South Campus, PA
Community College of Beaver County, PA
Concordia College, MI
Concordia College, MN
Concordia College, MN
Concordia College, NY
Concordia College, OR
Concordia College Wisconsin, WI
Concordia Lutheran College, TX
Connecticut College, CT
Cooper Union , NY
Copiah-Lincoln Community College, MS
Cornell College, IA
Corning Community College, NY
Corpus Christi State University, TX
Cosumnes River College, CA
Covenant College, GA
Cowley County Community College and Vocational-Technical School, KS
Crandall Junior College, GA
Craven Community College, NC
Crichton College, TN
Criswell College, TX
Culver-Stockton College, MO
CUNY - City College, NY
CUNY - College of Staten Island , NY
CUNY - Kingsborough Community College, NY
CUNY - LaGuardia Community College , NY
CUNY - Manhattan Community College , NY
CUNY - York College, NY
Curry College, MA
Cuyahoga Community College, OH
Cypress College, CA
Dakota Wesleyan University, SD
Dalton College, GA
Dana College, NE
Daniel Webster College, NH
Danville Community College, VA
Dartmouth College, NH
Davidson College, NC
Davis Elkins College, WV
Daytona Beach Community College, FL
De Anza College, CA
Defiance College, OH
Del Mar College, TX
Delaware Technical and Community College, Southern Campus, DE
Delaware Valley College, PA
Delta State University, MS
Denison University, OH
Denmark Technical College, SC
DePaul University, IL
DePauw University, IN
DeVry Institute of Technology, GA
DeVry Institute of Technology, TX
DeVry Institute of Technology, IL
Dickinson College, PA
Dickinson State University, ND
Dodge City Community College, KS
Dordt College, IA
Drake University, IA
Drew University, NJ
Drury College, MO
Durham Technical Community College, NC
Dutchess Community College, NY
East Carolina University, NC
East Central College, MO
East Georgia College, GA
East Los Angeles College, CA
East Tennessee State University, TN
East Texas State University, TX
East Texas State University at Texarkana, TX
Eastern Connecticut State University, CT
Eastern Kentucky University, KY

Eastern Mennonite College, VA
Eastern Michigan University, MI
Eastern Montana College, MT
Eastern New Mexico University, NM
Eastern New Mexico University - Clovis, NM
Eastern Oregon State College, OR
Eastern Shore Community College, VA
Eastern Washington University, WA
Eckerd College, FL
Edgecombe Community College, NC
Edgewood College, WI
Edinboro University of Pennsylvania, PA
Edison Community College, FL
Edison State Community College, OH
Edmonds Community College, WA
El Camino College, CA
El Paso Community College, TX
Elgin Community College, IL
Elizabeth City State University, NC
Elmira College, NY
Elon College, NC
Embry-Riddle Aeronautical University, FL
Embry-Riddle Aeronautical University, AZ
Emory Henry College, VA
Emory University, GA
Emporia State University, KS
Erie Community College, City Campus, NY
Erie Community College, North Campus, NY
Erie Community College, South Campus, NY
Erskine College, SC
Essex Community College, MD
Everett Community College, WA
Fairleigh Dickinson University, Rutherford Campus, NJ
Fairmont State College, WV
Fayetteville State University, NC
Fergus Falls Community College, MN
Ferrum College, VA
Fitchburg State College, MA
Flagler College, FL
Flaming Rainbow University, OK
Florida Atlantic University, FL
Florida Baptist Theological College, FL
Florida Community College at Jacksonville, FL
Florida Institute of Technology, FL
Florida State University, FL
Floyd College, GA
Fontbonne College, MO
Fordham University, NY
Forsyth Technical Community College, NC
Fort Hays State University, KS
Fort Lewis College, CO
Fort Scott Community College, KS
Francis Marion College, SC
Frank Phillips College, TX
Franklin and Marshall College, PA
Franklin College of Indiana, IN
Franklin Pierce College, NH
Franklin University, OH
Frederick Community College, MD
Free Will Baptist Bible College, TN
Freed-Hardeman College, TN
Friends World College, NY
Front Range Community College, CO
Frostburg State University, MD
Furman University, SC
Gallaudet University, DC
Gannon University, PA
Garden City Community College, KS
Garrett Community College, MD
Genesee Community College, NY
Geneva College, PA
George Washington University, DC
Georgetown College, KY
Georgetown University, DC
Georgia Military College, GA
Georgia Southern College, GA
Georgia Southwestern College, GA
Georgia State University, GA
Gettysburg College, PA
Glen Oaks Community College, MI
Glendale Community College, CA
Glenville State College, WV
Gloucester County College, NJ
Gogebic Community College, MI
Gonzaga University, WA
Gordon College, GA
Gordon College, MA
Goshen College, IN
Governors State University, IL
Graceland College, IA
Grand Canyon University, AZ
Grand Valley State University, MI
Grand View College, IA
Grays Harbor College, WA
Grayson County College, TX
Greenville College, IL
Grossmont College, CA
Grove City College, PA
Guilford College, NC
Gustavus Adolphus College, MN
Hagerstown Junior College, MD
Hamilton College, NY
Hamline University, MN
Hampshire College, MA
Hannibal-LaGrange College, MO
Harcum Junior College, PA
Harris-Stowe State College, MO
Harrisburg Area Community College, PA
Hartnell College, CA
Hartwick College, NY
Harvard University, MA
Harvey Mudd College, CA
Hastings College, NE
Haverford College, PA

Haywood Community College, NC
Heidelberg College, OH
Hendrix College, AR
High Point College, NC
Highland Community College, IL
Highland Community College, KS
Highline Community College, WA
Hillsborough Community College, FL
Hillsdale College, MI
Hiram College, OH
Hofstra University, NY
Hollins College, VA
Hope College, MI
Houghton College, NY
Housatonic Community College, CT
Houston Baptist University, TX
Howard Community College, MD
Howard Payne University, TX
Howard University, DC
Huntingdon College, AL
Huntington College, IN
Husson College, ME
Illinois Benedictine College, IL
Illinois Benedictine College, IL
Illinois Eastern Community Colleges, Olney Central College, IL
Illinois Institute of Technology, IL
Illinois Valley Community College, IL
Indian Hills Community College, IA
Indiana Institute of Technology, IN
Indiana State University, IN
Indiana U-Purdue U at Indianapolis, IN
Indiana University - Purdue University at Fort Wayne, IN
Indiana University at Kokomo, IN
Indiana University East, IN
Indiana University of Pennsylvania, PA
Indiana University Southeast, IN
Indiana University-Bloomington, IN
Indiana Vocational Technical College-North, IN
Indiana Vocational Technical College-Southcentral, IN
Indiana Vocational Technical College-Wabash Valley, IN
Indiana Wesleyan University, IN
Inver Hills Community College, MN
Iona College, NY
Iowa Lakes Community College, IA
Iowa State Univ of Science Tech, IA
Irvine Valley College, CA
Isothermal Community College, NC
Itawamba Community College, MS
Ithaca College, NY
Jackson Community College, MI
Jacksonville State University, AL
James Madison University, VA
Jamestown College, ND
Jamestown Community College, NY
Jarvis Christian College, TX
John Brown University, AR
John C. Calhoun State Community College, AL
John Wood Community College, IL
Johnson Bible College, TN
Johnson C. Smith University, NC
Johnson County Community College, KS
Joliet Junior College, IL
Jones County Junior College, MS
Jordan College, MI
Judson College, AL
Judson College, IL
Juniata College, PA
Kalamazoo College, MI
Kalamazoo Valley Community College, MI
Kankakee Community College, IL
Kansas City Art Institute, MO
Kansas City Kansas Community College, KS
Kansas State University, KS
Kauai Community College, HI
Kean College of New Jersey, NJ
Kearney State College, NE
Kellogg Community College, MI
Kennesaw State College, GA
Kenyon College, OH
Keystone Junior College, PA
King's College, NY
King's College, PA
Kings River Community College, CA
Kirkwood Community College, IA
Knox College, IL
Kutztown University of Pennsylvania, PA
La Salle University, PA
Labette Community College, KS
Lafayette College, PA
Lake Michigan College, MI
Lakeland College, WI
Lakeland Community College, OH
Lakeshore Technical College, WI
Lakewood Community College, MN
Lamar Community College, CO
Lander College, SC
Lane Community College, OR
Laramie County Community College, WY
Laredo Junior College, TX
Le Moyne College, NY
Lee College, TN
Lee College, TX
Lees-McRae College, NC
Lehman College, CUNY, NY
Lenoir Community College, NC
LeTourneau College, TX
Lewis Clark College, OR
Lewis-Clark State College, ID
Lincoln University, PA
Lindsey Wilson College, KY
Linn-Benton Community College, OR

Lock Haven Univ. of Pennsylvania, PA
Long Beach City College, CA
Long Island University,
Southampton Campus, NY
Longview Community College, MO
Lorain County Community College, OH
Loras College, IA
Los Angeles Harbor College, CA
Louisiana College, LA
Louisiana State University at Alexandria, LA
Lourdes College, OH
Lower Columbia College, WA
Loyola College, MD
Loyola University, New Orleans, LA
Lycoming College, PA
Lynchburg College, VA
Lyndon State College, VT
Macalester College, MN
Macomb Community College, MI
Macon College, GA
Madonna College, MI
Manchester College, IN
Manhattanville College, NY
Mankato State University, MN
Maranatha Baptist Bible College, WI
Marian College, IN
Marian College of Fond du Lac, WI
Marist College, NY
Marlboro College, VT
Marquette University, WI
Mars Hill College, NC
Marshalltown Community College, IA
Martin Center College, IN
Martin Community College, NC
Mary Baldwin College, VA
Mary Washington College, VA
Marycrest College, IA
Marygrove College, MI
Marymount University, VA
Marywood College, PA
Massachusetts Bay Community College, MA
Massachusetts College of Art, MA
Master's College, CA
McHenry County College, IL
McKendree College, IL
McLennan Community College, TX
McMurry College, TX
Medaille College, NY
Memphis College of Art, TN
Memphis State University, TN
Merced College, CA
Mercer University, GA
Mercy College, NY
Mercy College of Detroit, MI
Mercyhurst College, PA
Meredith College, NC
Meridian Community College, MS
Merrimack College, MA
Mesabi Community College, MN
Messiah College, PA
Miami University, OH
Miami-Dade Community College, FL
Mid Michigan Community College, MI
Mid-Plains Community College, NE
MidAmerica Nazarene College, KS
Middle Georgia College, GA
Middlesex County College, NJ
Midland Lutheran College, NE
Midlands Technical College, SC
Midway College, KY
Millersville University of Pennsylvania, PA
Milligan College, TN
Mills College, CA
Minot State University, ND
Mississippi College, MS
Mississippi Gulf Coast Community College, Perkinston
Campus, MS
Mississippi State University, MS
Mississippi University for Women, MS
Missouri Western State College, MO
Moberly Area Junior College, MO
Modesto Junior College, CA
Mohave Community College, AZ
Mohawk Valley Community College, NY
Mohegan Community College, CT
Monmouth College, IL
Monroe Community College, NY
Monroe County Community College, MI
Montana College of Mineral Science and Technology,
MT
Montcalm Community College, MI
Montclair State College, NJ
Monterey Peninsula College, CA
Montgomery College-Rockville Campus, MD
Montgomery Community College, NC
Montgomery County Community College, PA
Moody Bible Institute, IL
Moorhead State University, MN
Moraine Valley Community College, IL
Moravian College, PA
Morehead State University, KY
Morgan Community College, CO
Morgan State University, MD
Morningside College, IA
Morton College, IL
Motlow State Community College, TN
Mount Mary College, WI
Mount Olive College, NC
Mount Senario College, WI
Mount St. Mary's College, CA
Mount Vernon College, DC
Mount Wachusett Community College, MA
Mt. San Antonio College, CA
Mt. San Jacinto College, CA

Muhlenberg College, PA
Mundelein College, IL
Murray State University, KY
Muskegon College, MI
Muskegon Community College, MI
Muskingum College, OH
Napa Valley College, CA
Nash Community College, NC
Nashville State Technical Institute, TN
National-Louis University, IL
Navarro College, TX
Nazareth College of Rochester, NY
Nebraska College of Technical Agriculture, NE
Nebraska Wesleyan University, NE
Neosho County Community College, KS
Neumann College, PA
New College, Univ. of South Florida, FL
New Jersey Institute of Technology, NJ
New Mexico Junior College, NM
New Mexico Military Institute, NM
New Mexico State Univ - Main Campus, NM
New Mexico State University - Alamogordo, NM
New Mexico State University - Grants, NM
New York Institute of Technology, NY
Newberry College, SC
Nicholls State University, LA
North Adams State College, MA
North Carolina A T State Univ., NC
North Carolina School of the Arts, NC
North Carolina Wesleyan College, NC
North Central College, IL
North Central Michigan College, MI
North Central Missouri College, MO
North Country Community College, NY
North Greenville College, SC
North Harris County College District, TX
North Hennepin Community College, MN
North Seattle Community College, WA
North Shore Community College, MA
Northampton County Area
Community College, PA
Northcentral Technical College, WI
Northeast Community College, NE
Northeast Mississippi Community College, MS
Northeast Missouri State University, MO
Northeastern Illinois University, IL
Northeastern Junior College, CO
Northeastern State University, OK
Northern Arizona University, AZ
Northern Kentucky University, KY
Northern Michigan University, MI
Northern Nevada Community College, NV
Northern Virginia Community College, VA
Northland Pioneer College, AZ
Northrop University, CA
Northwest Missouri State University, MO
Northwestern College, IA
Northwestern Connecticut
Community College, CT
Oakland Community College, MI
Oakland University, MI
Oakton Community College, IL
Oakwood College, AL
Oberlin College, OH
Ocean County College, NJ
Odessa College, TX
Oglala Lakota College, SD
Oglethorpe University, GA
Ohio Dominican College, OH
Ohio Northern University, OH
Ohio State University-Mansfield Campus, OH
Ohio State University-Marion Campus, OH
Ohio State University-Newark Campus, OH
Ohio University-Chillicothe, OH
Ohlone College, CA
Oklahoma Baptist University, OK
Oklahoma City Community College, OK
Oklahoma Panhandle State University, OK
Oklahoma State University, OK
Old Dominion University, VA
Olivet Nazarene University, IL
Oral Roberts University, OK
Orange Coast College, CA
Orangeburg-Calhoun Technical College, SC
Oregon Health Sciences University, OR
Oregon State University, OR
Otis Art Institute of Parsons, School of, CA
Ottawa University, KS
Our Lady of Holy Cross College, LA
Our Lady of the Lake University of
San Antonio, TX
Oxnard College, CA
Pacific Lutheran University, WA
Pacific Oaks College, CA
Pan American University, TX
Panola Junior College, TX
Paris Junior College, TX
Parkland College, IL
Pasadena City College, CA
Pasco-Hernando Community College, FL
Paul D. Camp Community College, VA
Peace College, NC
Pearl River Community College, MS
Pellissippi State Technical
Community College, TN
Pennsylvania College of Technology, PA
Pennsylvania State Univ. at Erie, , PA
Pennsylvania State Univ.,
Univ. Park Campus, PA
Pennsylvania State University Worthington
Scranton Campus, PA
Pennsylvania State University York Campus, PA
Phillips County Community College, AR
Phillips University, OK

Piedmont College, GA
Piedmont Community College, NC
Piedmont Technical College, SC
Pierce College, WA
Pikes Peak Community College, CO
Pine Manor College, MA
Pinebrook Junior College, PA
Pittsburg State University, KS
Pitzer College, CA
Plymouth State College, NH
Point Park College, PA
Portland State University, OR
Prairie State College, IL
Prairie View A M University, TX
Pratt Community College, KS
Pratt Institute, NY
Presbyterian College, SC
Prince George's Community College, MD
Princeton University, NJ
Principia College, IL
Purdue University Calumet, IN
Purdue University North Central, IN
Quincy College, IL
Quincy Junior College, MA
Quinnipiac College, CT
Quinsigamond Community College, MA
Radford University, VA
Rancho Santiago College, CA
Randolph Community College, NC
Randolph-Macon College, VA
Randolph-Macon Woman's College, VA
Reading Area Community College, PA
Red Rocks Community College, CO
Reed College, OR
Regis College, CO
Reinhardt College, GA
Rhode Island College, RI
Rhode Island School of Design, RI
Rhodes College, TN
Richard Bland College, VA
Richland College, TX
Rider College, NJ
Ringling School of Art and Design, FL
Rio Hondo College, CA
Riverside Community College, CA
Roane State Community College, TN
Robert Morris College, PA
Roberts Wesleyan College, NY
Rochester Community College, MN
Rockhurst College, MO
Rocky Mountain College, MT
Rose State College, OK
Rose-Hulman Institute of Technology, IN
Russell Sage College, NY
Rust College, MS
Rutgers University-Camden Campus, NJ
Sacramento City College, CA
Sacred Heart University, CT
Saginaw Valley State University, MI
Saint Bonaventure University, NY
Saint Charles County Community College, MO
Saint John's University, MN
Saint Joseph College, CT
Saint Joseph's College, ME
Saint Leo College, FL
Saint Martin's College, WA
Saint Mary College, KS
Saint Mary's College, IN
Saint Mary's College of Minnesota, MN
Saint Meinrad College, IN
Saint Michael's College, VT
Saint Xavier College, IL
Salem College, NC
Salisbury State University, MD
Salt Lake Community College, UT
Salve Regina College, RI
San Diego State University, CA
San Jacinto College -Central Campus, TX
San Joaquin Delta College, CA
San Juan College, NM
Santa Barbara City College, CA
Santa Clara University, CA
Santa Fe Community College, FL
Santa Fe Community College, NM
Santa Monica College, CA
Santa Rosa Junior College, CA
Savannah State College, GA
Schreiner College, TX
Scott Community College, IA
Scripps College, CA
Seattle Central Community College, WA
Seattle Pacific University, WA
Seattle University, WA
Seton Hall University, NJ
Seton Hill College, PA
Shelby State Community College, TN
Sheridan College, WY
Shimer College, IL
Shippensburg University of Pennsylvania, PA
Shoreline Community College, WA
Siena College, NY
Siena Heights College, MI
Silver Lake College, WI
Simpson College, IA
Sinclair Community College, OH
Skagit Valley College, WA
Skidmore College, NY
Snead State Junior College, AL
Sojourner-Douglass College, MD
Sonoma State University, CA
South Carolina State College, SC
South College, GA
South Dakota School of Mines Technology, SD
South Florida Community College, FL

South Georgia College, GA
South Mountain Community College, AZ
South Plains College, TX
South Puget Sound Community College, WA
South Suburban College, IL
Southeast Community College,
Beatrice Campus, NE
Southeast Community College,
Milford Campus, NE
Southeast Missouri State University, MO
Southeastern Illinois College, IL
Southeastern Massachusetts Univ, MA
Southeastern Oklahoma State University, OK
Southern Arkansas University, AR
Southern Arkansas University Tech, AR
Southern Arkansas University -
El Dorado Branch, AR
Southern Connecticut State University, CT
Southern Illinois Univ-Carbondale, IL
Southern Methodist University, TX
Southern Nazarene University, OK
Southern Oregon State College, OR
Southern State Community College, OH
Southern Union State Junior College, AL
Southern University and A M College, LA
Southern University, Shreveport -
Bossier City Campus, LA
Southern Utah State College, UT
Southwest Baptist University, MO
Southwest Missouri State University, MO
Southwest Texas State University, TX
Southwestern College, CA
Southwestern College, AZ
Southwestern Michigan College, MI
Southwestern Oklahoma State University, OK
Spartanburg Technical College, SC
St. Ambrose University, IA
St. Bonaventure University, NY
St. Cloud State University, MN
St. Edward's University, TX
St. Francis College, NY
St. John's College, MD
St. John's University, NY
St. Johns River Community College, FL
St. Joseph's College, Suffolk Campus, NY
St. Lawrence University, NY
St. Louis Community College at Forest Park, MO
St. Louis Community College at Meramec, MO
St. Mary's University of San Antonio, TX
St. Norbert College, WI
St. Olaf College, MN
St. Thomas University, FL
Stanford University, CA
State Fair Community College, MO
State Technical Institute at Memphis, TN
State University of New York College of Technology at
Canton, NY
Stephen F. Austin State University, TX
Sterling College, KS
Stevens Institute of Technology, NJ
Stockton State College, NJ
Stonehill College, MA
Suffolk County Community College -
Ammerman Campus, NY
Suffolk County Community College -
Western Campus, NY
Sul Ross State University, TX
Sumter Area Technical College, SC
SUNY College at Brockport, NY
SUNY College at Buffalo, NY
SUNY College at New Paltz, NY
SUNY College at Old Westbury, NY
SUNY College at Oneonta, NY
SUNY College at Potsdam, NY
SUNY College of Environmental Science Forestry, NY
SUNY- College at Cobleskill, NY
SUNY-Albany, NY
SUNY-College of Technology at
Farmingdale, NY
SUNY-Empire State College, NY
SUNY-Health Science Ctr Brooklyn, NY
Susquehanna University, PA
Swarthmore College, PA
Sweet Briar College, VA
Tacoma Community College, WA
Technical College of the Lowcountry, SC
Tennessee Technological University, TN
Tennessee Temple University, TN
Texas A I University, TX
Texas A M University, TX
Texas Lutheran College, TX
Texas Tech University, TX
Texas Woman's University, TX
Thomas A. Edison State College, NJ
Thomas College, GA
Tidewater Community College,
Chesapeake Campus, VA
Tomlinson College, TN
Tompkins Cortland Community College, NY
Tougaloo College, MS
Towson State University, MD
Transylvania University, KY
Trinidad State Junior College, CO
Trinity Christian College, IL
Trinity University, TX
Triton College, IL
Truckee Meadows Community College, NV
Tufts University, MA
Tulane University of Louisiana, LA
Tulsa Junior College, OK
Tuskegee University, AL
Tyler Junior College, TX
Umpqua Community College, OR
Union College, NE

Union College, NY
Union County College, NJ
United States Air Force Academy, CO
United States Coast Guard Academy, CT
United States Military Academy, NY
United States Naval Academy, MD
Univ. of Hawaii-Kapiolani Community College, HI
University of Akron, OH
University of Alabama-Birmingham, AL
University of Alaska Southeast, Sitka Campus, AK
University of Alaska-Fairbanks, AK
University of Arizona, AZ
University of Arkansas-Little Rock, AR
University of Baltimore, MD
University of California at Berkeley, CA
University of California, Davis, CA
University of California, Los Angeles, CA
University of California, Riverside, CA
University of California, San Diego, CA
University of California, Santa Barbara, CA
University of California, Santa Cruz, CA
University of Central Texas, TX
University of Charleston, WV
University of Colorado at Denver, CO
University of Connecticut, CT
University of Dallas, TX
University of Delaware, DE
University of Findlay, OH
University of Georgia, GA
University of Hawaii at Hilo, HI
University of Hawaii -Kapiolani Community College, HI
University of Hawaii -Kauai Community College, HI
University of Hawaii -Maui Community College, HI
University of Hawaii - Windward Community College, HI
University of Hawaii-West Oahu, HI
University of Houston, TX
University of Houston-Victoria, TX
University of Idaho, ID
University of Indianapolis, IN
University of Iowa, IA
University of Kentucky, KY
University of Kentucky, Elizabethtown Community College, KY
University of Kentucky, Hopkinsville Community College, KY
University of Kentucky, Lexington Community College, KY
University of Kentucky, Madisonville Community College, KY
University of Kentucky, Maysville Community College, KY
University of Kentucky, Paducah Community College, KY
University of Kentucky, Southeast Community College, KY
University of La Verne, CA
University of Lowell, MA
University of Maine at Fort Kent, ME
University of Maine at Presque Isle, ME
University of Maryland at Baltimore, MD
University of Maryland Eastern Shore, MD
University of Miami, FL
University of Michigan, MI
University of Michigan-Dearborn, MI
University of Minnesota, Crookston, MN
University of Minnesota, Duluth, MN
University of Minnesota, Morris, MN
University of Minnesota, Waseca, MN
University of Mississippi, MS
University of Missouri-Columbia, MO
University of Missouri-Kansas City, MO
University of Missouri-Rolla, MO
University of Missouri-Saint Louis, MO
University of Montevallo, AL
University of Nebraska-Lincoln, NE
University of Nevada, Reno, NV
University of Nevada-Las Vegas, NV
University of New England, ME
University of New Hampshire, NH
University of New Hampshire at Manchester, NH
University of New Haven, CT
University of New Mexico, NM
University of New Mexico - Gallup Branch, NM
University of New Orleans, LA
University of North Carolina - Chapel Hill, NC
University of North Carolina - Charlotte, NC
University of North Carolina - Greensboro, NC
University of North Florida, FL
University of North Texas, TX
University of Notre Dame, IN
University of Oklahoma, OK
University of Oregon, OR
University of Pennsylvania, PA
University of Phoenix, AZ
University of Puget Sound, WA
University of Rhode Island, RI
University of Richmond, VA
University of Rio Grande, OH
University of Rochester, NY
University of San Diego, CA
University of San Francisco, CA
University of Scranton, PA
University of South Alabama, AL
University of South Carolina at Aiken, SC
University of South Carolina at Spartanburg, SC
University of South Carolina, Columbia, SC

University of South Carolina-
Coastal Carolina College, SC
University of South Carolina-Lancaster, SC
University of South Dakota, SD
University of South Florida, FL
University of Southern California, CA
University of Southern Colorado, CO
University of Southern Indiana, IN
University of Southern Maine, ME
University of Southwestern Louisiana, LA
University of Tampa, FL
University of Tennessee at Martin, TN
University of Tennessee - Chatanooga, TN
University of Tennessee - Health Sciences, TN
University of Tennessee - Knoxville, TN
University of Texas at Austin, TX
University of Texas, San Antonio, TX
University of Texas, Galveston, TX
University of Texas, Permian Basin, TX
University of Texas-Arlington, TX
University of Texas-Dallas, TX
University of Texas-Houston, TX
University of the Arts, PA
University of the Ozarks, AR
University of the South, TN
University of Tulsa, OK
University of Utah, UT
University of Virginia-Main Campus, VA
University of West Florida, FL
University of Wisconsin Center -
Fond du Lac, WI
University of Wisconsin Center -
Fox Valley, WI
University of Wisconsin Center -
Manitowoc County, WI
University of Wisconsin Center -
Marshfield/Wood County, WI
University of Wisconsin Center -
Rock County, WI
University of Wisconsin Center -
Sheboygan County, WI
University of Wisconsin Center -
Washington County, WI
University of Wisconsin Center -
Waukesha County, WI
University of Wisconsin-Eau Claire, WI
University of Wisconsin-Green Bay, WI
University of Wisconsin-La Crosse, WI
University of Wisconsin-Madison, WI
University of Wisconsin-River Falls, WI
University of Wisconsin-Stevens Point, WI
University of Wisconsin-Stout, WI
University of Wisconsin-Superior, WI
Urbana University, OH
Ursuline College, OH
Utah Valley Community College, UT
Utica College of Syracuse University, NY
Valparaiso University, IN
Vanderbilt University, TN
Vermilion Community College, MN
Vermont State Colleges System Office, VT
Victor Valley College, CA
Victoria College, TX
Villa Julie College, MD
Villanova University, PA
Vincennes University, IN
Vincennes University - Jasper Center, IN
Virginia Community College-System, VA
Virginia Highlands Community College, VA
Virginia Intermont College, VA
Virginia Military Institute, VA
Virginia Polytechnic Inst State Univ, VA
Viterbo College, WI
Volunteer State Community College, TN
Wagner College, NY
Wake Forest University, NC
Walla Walla College, WA
Walsh College of Accountancy and
Business Administration, MI
Walters State Community College, TN
Warner Southern College, FL
Warren County Community College Commission, NJ
Warren Wilson College, NC
Wartburg College, IA
Washington State University, WA
Washington University, MO
Washtenaw Community College, MI
Waukesha County Technical College, WI
Waycross College, GA
Wayne Community College, NC
Webber College, FL
Weber State College, UT
Webster University, MO
Wells College, NY
Wentworth Institute of Technology, MA
Wesleyan College, GA
West Hills College, CA
West Liberty State College, WV
West Los Angeles College, CA
West Texas State University, TX
West Valley College, CA
West Valley Community College, CA
West Virginia Institute of Technology, WV
West Virginia Northern
Community College, WV
West Virginia University, WV
West Virginia University at Parkersburg, WV
Westbrook College, ME
Westchester Community College, NY
Western Carolina University, NC
Western Connecticut State University, CT
Western Illinois University, IL

Western Maryland College, MD
Western Michigan University, MI
Western Nebraska Community College, NE
Western New England College, MA
Western State College of Colorado, CO
Westfield State College, MA
Westmar College, IA
Westminster Choir College, NJ
Westminster College, MO
Westmont College, CA
Westmoreland County Community College, PA
Whatcom Community College, WA
Wheaton College, MA
Whitman College, WA
Whittier College, CA
Widener University, PA
Wilkes Community College, NC
Wilkes University, PA
Willamette University, OR
William Jewell College, MO
William Paterson College of New Jersey, NJ
William Penn College, IA
William Rainey Harper College, IL
Williams College, MA
Winston-Salem State University, NC
Winthrop College, SC
Wisconsin Lutheran College, WI
Wittenberg University, OH
Wofford College, SC
Woodbury University, CA
Worcester Polytechnic Institute, MA
Worcester State College, MA
Worthington Community College, MN
Wright State University, Lake Campus, OH
Wright State University-Main Campus, OH
Wytheville Community College, VA
Xavier University, OH
Yakima Valley Community College, WA
York Technical College, SC
Youngstown State University, OH

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